THE IRON AGE

239 West 39th St.,
New York

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Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50, including duty; Foreign $12.00 a year. Single copy 25 cents.

Cable Address, "Ironage, N. Y."

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Chestnut and 56th Sts., Philadelphia, Pa.

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MAY 2, 1935

ESTABLISHED 1855 Vol. 135, No. 18

Practical Training in Logic

IF Washington were to make up a list of "conscientious objectors" to the main principles of the New Deal, the metal-working industry would be placed at or near the top.

This does not mean that the industry has refused to play ball according to the present rules. On the contrary, it has a record of compliance that is second to none, in spite of the instinctive feeling among a majority of the players that the rules are not what they should be, and that neither the public, the employer or the worker can win under them.

Why is this feeling, which is an honest conviction and one not based upon politics or personal profit considerations, so prevalent in this industry? Is it because its members are reactionaries, Tories, men immune to thoughts of progress for mankind?

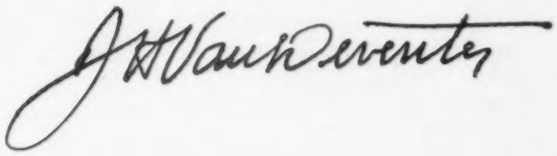
No. The answer to this question lies in another quarter. The men of the metal-working industry have had an intensive training in logic, through their association with machinery.

The machine is the true exponent of logic. If there is anything wrong in principle in connection with its design or construction, it cannot be made to work. Those who deal with machines cannot afford to fool themselves, they must constantly seek the truth.

There can be no operative fallacies in a mechanism. All of the legislative bodies on earth would find it impossible to compel an 8 pitch gear to mesh with a 6 pitch gear. Men in our industry know instinctively and through experience that there can be no such thing as perpetual motion, or an engine that will deliver more energy in one form than is fed to it in another.

Once upon a time, there was a gentleman named Keeley who exhibited a new deal in the form of an engine which apparently would do that very thing. He sold stock rapidly to the public until a canny mechanic discovered the concealed compressed air line which ran to the engine through the floor and which enabled it to perform the supposed miracle of producing something from nothing. When this pipe was disconnected, the miracle vanished in thin air, together with the funds that investors had put into it.

Mechanically-minded men are wondering what will happen to the new deal in economics when the feed pipe of Government spending ceases to function.



Flame Cutting Curved Plates For

IN the construction of Boulder Dam many new machines and methods have of necessity been developed because of the gigantic size of the project and the enormous scale on which operations are conducted. Installation of the penstock system has been no exception. In fabricating the penstock pipes, the largest ever constructed, unusual demands have been made on oxy-acetylene cutting.

Branch outlets in the 30-ft. diameter conduits have in particular

By W. S. WALKER
Welding Engineer,
Linde Air Products Co., Cleveland

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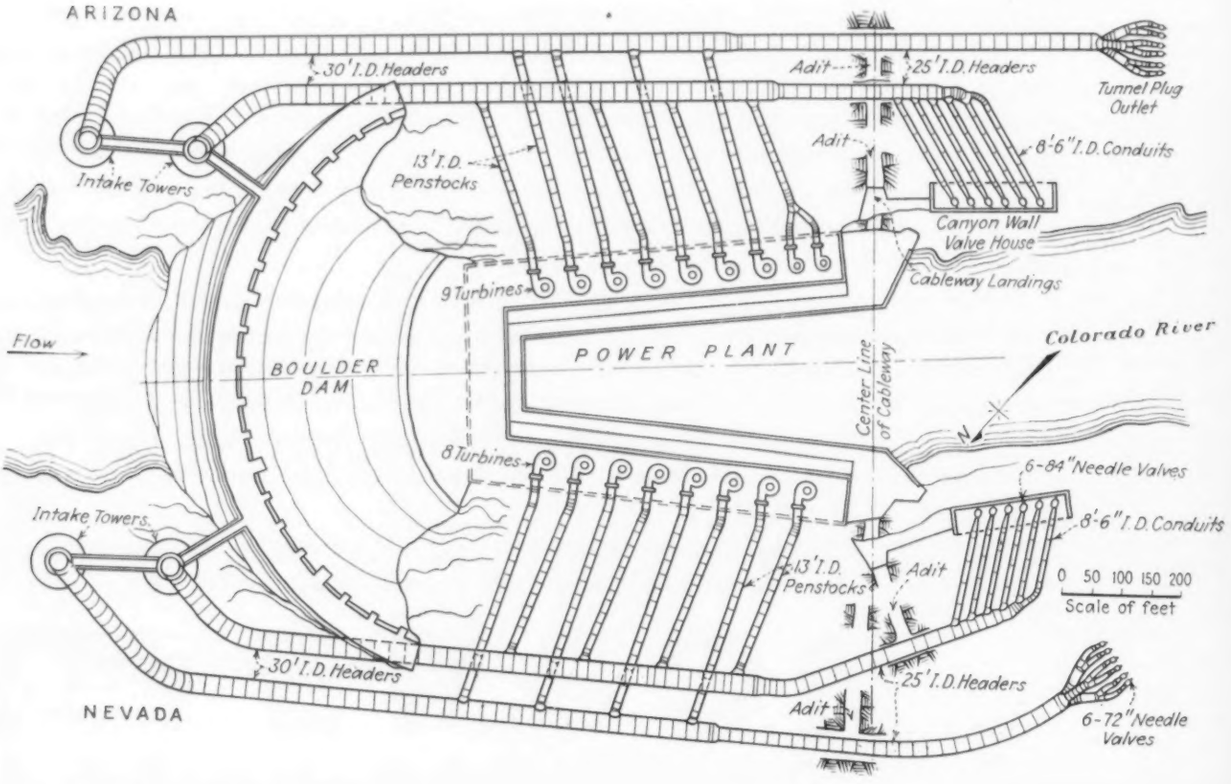
required a new type of machine flame cutting. These outlets are made up from a number of plates, which, after being formed into the proper curved shapes, must be accurately trimmed for final line-up and welding into a complete nozzle. The speedy and economical trimming of these curved plates is being done with a portable oxy-acetylene cutting machine, especially altered for this difficult job.

The tremendous size of the penstock system, being fabricated and installed by the Babcock & Wilcox Co., may be seen in Fig. 1. The four main conduits leading from the intake towers are 30 ft. in diameter, from 1 11/16 to 2¾ in. in wall thickness, and will have a total length of about 4700 ft. The penstocks, 13 ft. in diameter, branch from the main conduits to the hydraulic turbines located in the power house below the dam.



Boulder Dam Penstocks

FABRICATION of the branch outlets of the 30-ft. diameter conduits in the penstock system of Boulder Dam has made unusual demands on oxy-acetylene cutting. These outlets are made up from a number of plates which after being formed must be trimmed accurately, at the job, for final line-up and welding into a complete nozzle. The trimming required a flame cutting machine especially arranged both to guide the blowpipe or torch over irregularly curved plates and also to give the cut edge a slight scarf or bevel. Details of the work, as well as of the equipment developed to do it, are given in this article, which is from a paper presented by Mr. Walker at a recent meeting of the Cleveland section of the American Welding Society. Welding, X-raying and other equipment at the notable Boulder Dam field fabricating plant of the Babcock & Wilcox Co., has been pictured in previous issues of THE IRON AGE.

There are 16 penstocks in all, ranging in wall thickness from 15/16 to 1 5/16 in., and having a total length of 5600 ft. Below the penstock branches, the main conduits are reduced to 25 ft. in diameter. Each conduit finally reduces to six 8½-ft. diameter branches leading to control valves located farther down the stream from the power house. The 25-ft. diameter sections of the conduits range in wall thickness from 1⅝ to 2 5/16 in. and total 1900 ft. in length. The 8½-ft. diameter branches are 2300 ft. in length and range in thickness from ⅝ to 1 in. Approximately 45,000 tons of steel plate will be used in this penstock system, which will have a total length including its branches, of 14,500 ft.

Since most of this piping is much too large in diameter to ship by railroad, the steel plate is shipped from the mill to a fabricating plant built near the dam.

AT LEFT

FIG. 1.—Layout of Boulder Dam penstock system being fabricated and installed by the Babcock & Wilcox Co. The four main conduits leading from the intake towers are 30 ft. in diameter and range from 1 11/16 to 2¾ in. in wall thickness.

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AT RIGHT

FIG. 2.—A 30-ft. diameter, fabricated section ready for installation in the penstock system. It consists of six plates, each about 12 x 32 ft., a fillet-insert section for a stiffening ring, and supporting brackets.

In Fig. 2 is shown one of the 30-ft. diameter sections entirely fabricated and ready to be taken to the job and installed in the penstock system. This section consists of six plates, each about 12 x 32 ft., a fillet-insert section for a stiffening ring, and supporting brackets. The total length of each section is slightly less than 25 ft. All seams in this section are joined by fusion welding in accordance with the A.S.M.E. Boiler Construction Code, Unfired Pressure Vessel Section, class I welding. Over 400,000 linear feet of welding will be required in the entire job. The heaviest of the 30-ft. diameter pipe sections will weigh approximately 170 tons each.

As stated before, the plates for the penstock system range in thickness from ⅝ to 2¾ in. Some of the larger plates are of such a weight that only two can be

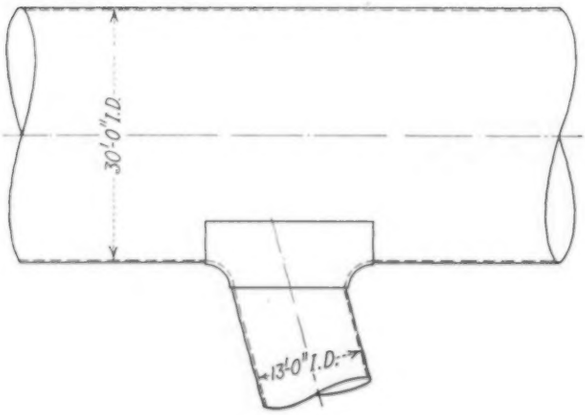


FIG. 3.—Diagram of branch outlet in main conduits. Tremendous pressures are needed for forming the eight plate sections required for each outlet.

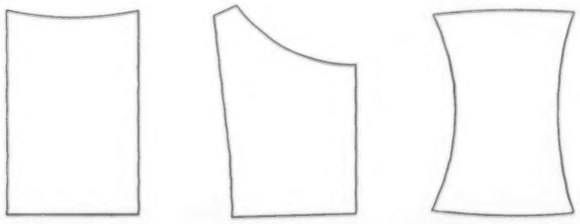


FIG. 4.—Sketch showing shape and size of flat plates required for one branch outlet. Thickness of these plates ranges from 2¼ to 4¼ in.

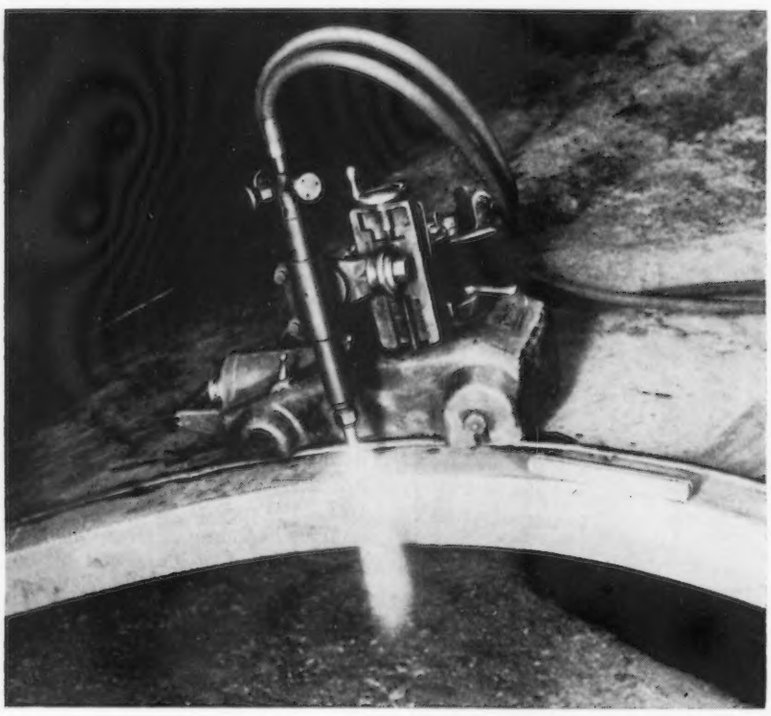


FIG. 5.—Portable flame cutting machine in operating position on one of the curved plates. It follows a template, tack welded to the work, to give the irregular curve desired. The oxy-acetylene blowpipe, or torch, cuts 4-in. plate at a speed of 10 in. per min.

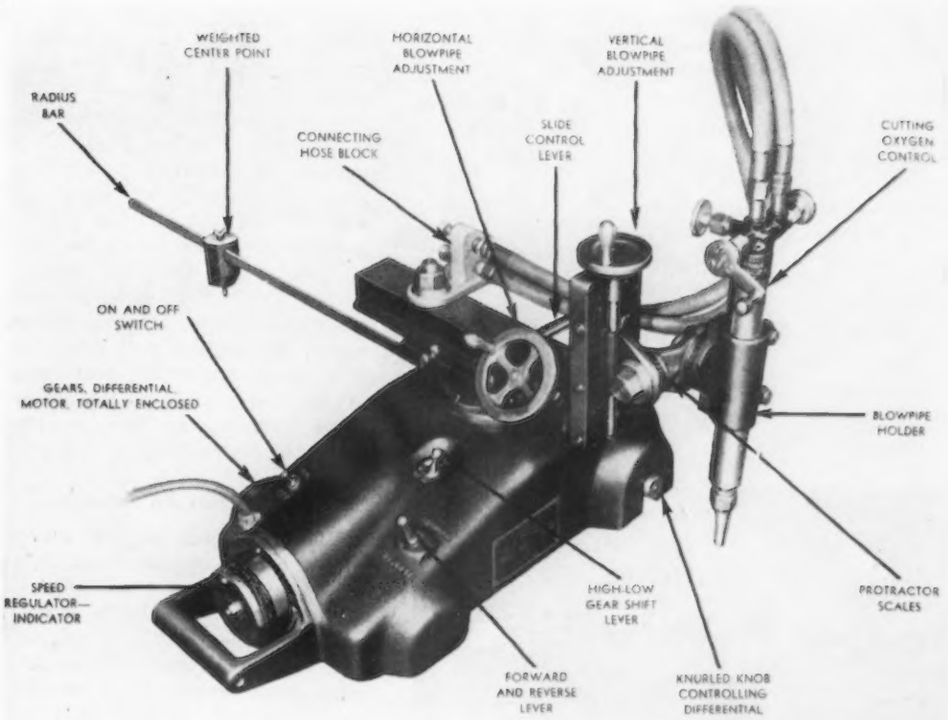
shipped on one car to the field plant near the dam. In manufacturing the steel plate at the mill, ingots are first reduced to slabs approximately 2 ft. in thickness. These are cut to the proper length for the finished plates by machine flame cutting and are then rolled to the required thickness. The final step at the mill is to flame cut the plates to the ordered size, this cutting being held within ⅛ in. The ordered size is ¼ in. larger on each side than the final dimensions of the plate used in the assembly of the sections at Boulder Dam. Mechanically driven blowpipes are used for cutting the plate at the mill.

Not all of the penstock system, however, is prepared for fabrication in the field plant near the dam. Plates for the branch outlets from the main conduits are shipped to the Barberton, Ohio, plant of the Babcock & Wilcox Co., where special presses needed for bending the plates making up the outlets are available. After the plates have been formed to shape and dimensions at Barberton, they are shipped to Boulder Dam for assembly and fabrication by welding.

The branch outlets are of the so-called "streamline" design shown in Fig. 3—very desirable from a hydraulic standpoint. Special dies and tremendous presses are needed for forming the various plate sections, eight of which are required for each outlet. The penstocks are 15 deg. from perpendicular to the conduits, the angle found to be best for hydraulic efficiency.

Trimming of Plates After Forming

The problem of trimming the plates after forming so that they would fit together accurately was a real one. Obviously flame cutting was the answer but work with the hand blowpipe would not be smooth enough. Further, there were no machines available that would guide a blowpipe over irregularly curved plates and give the slightly scarfed edge desired. Modified radial cutting is required for this type of construction. In true radial cutting the blowpipe is kept perpendicular to the plane tangent to the curved surface of the plate. In this work it was desired to give the cut edge a slight scarf or bevel to aid in forming the joint between plates. Actually then, radial



AT LEFT

FIG. 6.—General features of the oxy-acetylene cutting machine are shown in this view. The unit may be equipped with track for straight-line work, and, as here pictured, with radius bar for cutting circles.

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BELOW

FIG. 7.—For cutting material thicker than 12 in., a water-cooled blowpipe is used. This view shows a machine so equipped cutting through 24 in. of steel at a travel speed of 4 in. per min.

cutting was carried out except for the fact that the blowpipe was held approximately 2 or 3 deg. away from the radial position, measured cross-ways to the line of travel.

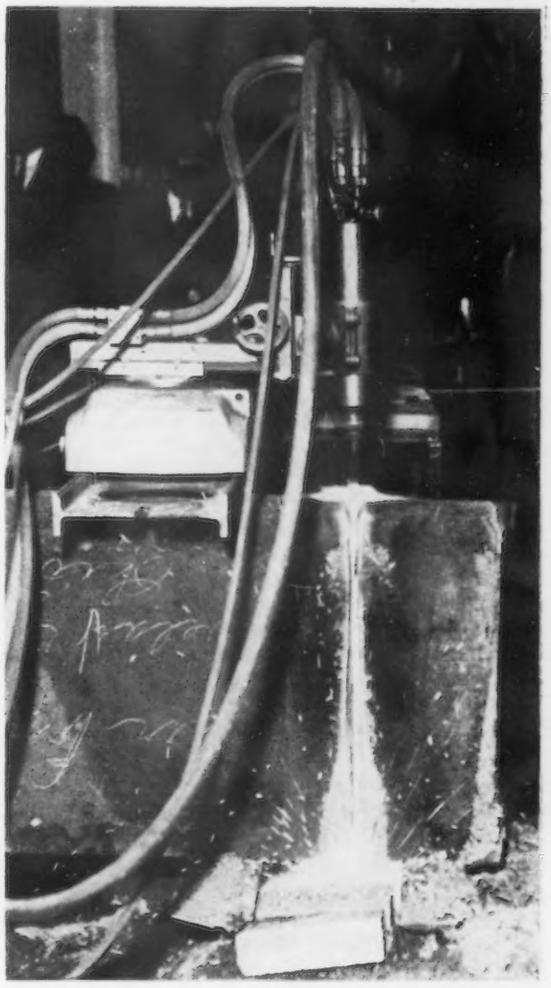
It was finally found possible to do the radial cutting required by making certain alterations to a portable cutting machine employed for cutting the flat plates to approximate shape for forming.

The preliminary cutting of the plates is done somewhat oversize and in the flat position. In Fig. 4 are shown the shape and size of the flat plates required for one streamline branch outlet. The thickness of these plates varies from 2½ to 4½ in. These nozzles must of necessity be thicker than the main conduits or the penstocks, because of the higher stresses around the opening.

Cutting Machine Follows Templet

The portable flame cutting machine used for this work is shown in Fig. 5 in operating position on one of the curved plates. This is the Oxweld Monitor, designed and marketed by the Linde Air Products Co. It follows the templet, which is tack-welded to the work, to give the irregular curve desired. The oxy-acetylene blowpipe mounted on this machine is cutting the 4-in. plate at a speed of 10 in. per min.

This machine is also commonly used for cutting straight lines when running on the track supplied with it. Fig. 6 shows the general features of the machine with radius bar attached for cutting circles, for which work the machine travels directly on the plate. The small levers shown are for the starting switch, reversing gear and the dual ratio gear. When the reversing gear lever is set at neutral, the machine can be free-wheeled into position for cutting. The speed regulator, near the handle, may be set for any



speed up to 48 in. per min. The higher speeds are needed when cutting inside circles on thin plate or when plate edge preparation is to be done.

The turret head, on which one or two blowpipes may be mounted, may be swung through a horizontal arc of 250 deg. This makes it possible to locate the blowpipes at any point desired on the sides or in front of the machine. Vertical and horizontal adjustments for the blowpipe make for flexible operation. The universal joint adjustment of the arm holding the blowpipe allows the blowpipe to be tilted 90 deg. in either direction parallel to the machine and up to 90 deg. at right angles from the side. This is valuable for beveling plates, and giving a leading angle to the nozzle, where this assists the cutting. Protractor scales are provided so that the desired angle can be quickly and accurately set.

A differential in the driving axle assures good traction at both drive wheels, on opposite sides of the machine. This is especially desirable for cutting circles and curves. The knurled knob on the drive wheel, visible in the illustration, is for locking the differential gear, when desired, as for straight cutting. The weight of the machine and its close speed control are necessary to give smooth cuts, free from the results of vibration.

The machine may be equipped with two blowpipes for simultaneous operation in cutting flange rings from plate, or for cutting long sections with parallel edges from plate.

For cutting material thicker than 12 in., a heavy-duty, water-cooled blowpipe is used with the machine. A machine equipped with this blowpipe is pictured in Fig. 7 cutting through 24 in. of steel. It moves along at 4 in. a minute and the oxygen pressure at the regulator is 40 lb. per sq. in.

FIG 8.—Bottom view of the cutting machine showing the three-wheel method of support for cutting curved or warped plates.

Driving Wheel Arrangement Changed

The changes made to permit the standard Oxweld Monitor to operate on curved plates for the branch outlets are seen in the bottom view of the machine, shown in Fig. 8. Normally the machine runs on four wheels. The two front wheels at the right furnish the drive and the two rear wheels are idlers. Since three-point support was necessary on the curved surfaces, the idler wheel at the lower left was removed entirely. The lower right-hand driving wheel was moved back to approximately the center of the machine and coupled with the driving axle by a sprocket chain. This arrangement of the driving wheel still permits the differential to function when the machine is traveling in a curved line. The chain driven wheel was knurled and lowered the proper amount to compensate for the templet on which the two grooved wheels run. The blowpipe was mounted opposite the chain driven wheel, in direct line with it, so that it deviated very little from being at the proper angle to the curved plate surface, at any location along the cut.

Finished Plates Jig Assembled

Views of some of the curved plates are shown in Figs. 9-11, after having been trimmed with the machine altered in the manner described. The difficulty of this second cutting operation is evident when it is realized that the machine must not only keep the blowpipe approximately radial to the changing curvature of the plate as it travels along. It must also follow the templet for curvature in three dimensions and must go up and down grade at an even speed. The machine's oversize electric motor gives it ample power to climb a 20 per cent grade, and constant speed with changing loads is insured by the centrifugal type of governor.

The accuracy with which the formed and trimmed plates fit together due to radial cutting is shown in Fig. 12. The plates are assembled on a jig to check fit before shipment of the individual plate sections to Boulder Dam. At Boulder Dam they are again assembled and securely tack-welded in position and then fusion welded together to make a complete branch outlet. Single "U" welds are used with the bulk of the welding being done from the outside. The completely welded branch outlet is then fusion welded to the 30 ft. conduit section, serving as the junction section between branch and main header.

The final view of the plates assembled for welding gives a good idea of the complex curves cut by the portable machine. It was not originally intended for such special work but with the few alterations it has been relatively easy to do this rather unique job of mechanical flame cutting.

FIG 9-11.—Views of some of the curved plates which make up the branch outlets, after trimming by the modified flame cutting machine shown in Figs. 5 and 8.

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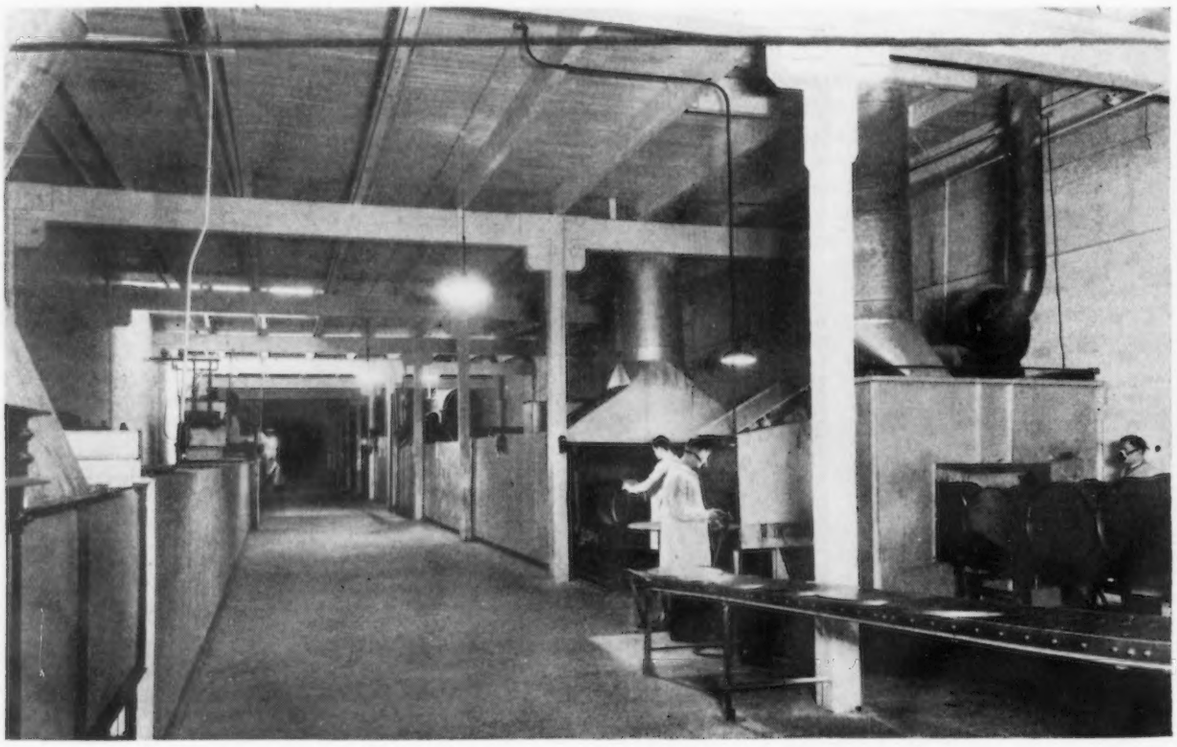
FIG. 12.—Final assembly of the plates making up a branch outlet, preparatory to welding.

Finishing Steel Barrels Used As Food Containers

By F. L. PRENTISS
Cleveland Resident Editor, The Iron Age

STEEL barrels used as food containers are spray-coated with a special food lacquer and dried in an air-conditioned room in the plant of the National Steel Barrel Co., Cleveland. Air that is purified by filtering is constantly circulated through the room by a blower system and drawn out by exhaust fans to prevent dirt and dust from entering the room and becoming deposited on the inside of the barrels and later causing contamination of their food contents.

The barrels are similar to the ordinary steel drums except that they have an open top and a cover which is held in place by a lever-type locking ring. As containers for lard, shortening, packers' malt and other food products many of these barrels are now being used



by manufacturers of these products in place of wooden barrels.

The air-purified paint room, which recently was provided for finishing the barrels, is several hundred feet long and about 45 ft. wide. It is inclosed on three sides by brick walls, has no windows and only three doors which are seldom opened. Air is delivered by two fans, one at each end of the room, having a capacity of 20,000 cu. ft. per min., and these force the air through banks of filters near the ceiling. The filter banks are built in the wall between the finishing room and adjoining shipping room from which the air is brought.

As the air in the shipping room is several degrees cooler than the outside air, the circulation of air from this room makes the finishing room comfortable in summer. Heat from the ovens makes it unnecessary to heat the incoming air in the winter. The air circulates down to the floor and is carried out by exhaust fans above the ovens and spray booths. The room is under slight air pressure at all times, which prevents dust-laden air from seeping in through doors and the fumes from the spray booths from mixing with the room air. The barrels leave the room with their covers sealed in place and the covers are not removed until the containers are filled in the customers' plants.

THE application of sanitary lacquers to food containers made of tin plate is familiar practice. Recently sanitary lacquers have been developed that can be applied directly to steel, making possible the use of large containers for food products. In this article the fabrication and the coating of barrels for use as food containers is described.

In addition to the provision of the air-conditioning finishing room, the barrel plant recently was rearranged, and power and gravity conveyors, ovens and other new equipment were added to increase plant efficiency by eliminating handling, speeding up work and increasing output. With the work moving almost continuously through the various production processes on conveyor lines, it takes only from 60 to 90 min. for a sheet of steel to reach the shipping room in the form of a finished barrel.

The manufacture of steel barrels for food containers starts with the shearing of the sheet to size. The pieces are then rolled to a cylindrical shape on bending rolls and move on a gravity conveyor to a Federal flash-welding machine which welds the longitudinal seam at the rate of 4 ft. per min.

From the welder the cylinder goes to a stripping machine, which removes the burr from both sides of the welded seam. This operates similar to a shaper except that it has cutting tools above and below to take off the burr on both the inner and outer side of the shell. The inside seam is then smoothed off by passing the shell on a carriage under a power-driven brush. Then the shell is set on end in a press on which the upper edge is curled. Then in one operation two beads or rolling hoops are pressed into the cylinder. The barrel is assembled by double seaming the bottom to the cylinder, the latter being fabricated on another production line.

After assembling, the barrel moves on a gravity conveyor to a testing machine where the seam and bottom are tested for leaks, after which it goes to a cleaning station where the barrels and tops

(CONTINUED ON PAGE 82)

AT LEFT

VIEW in the air-conditioned room for applying internal and external coatings to steel barrels used for food products. Barrels come into this room on a gravity conveyor at the extreme right, pass through a spray booth for the interior coating, and from there to a baking oven back of the booth. Covers are delivered on the adjoining conveyor and are sprayed by the man standing in front at the small booth. At the left is the oven for baking the exterior coating.

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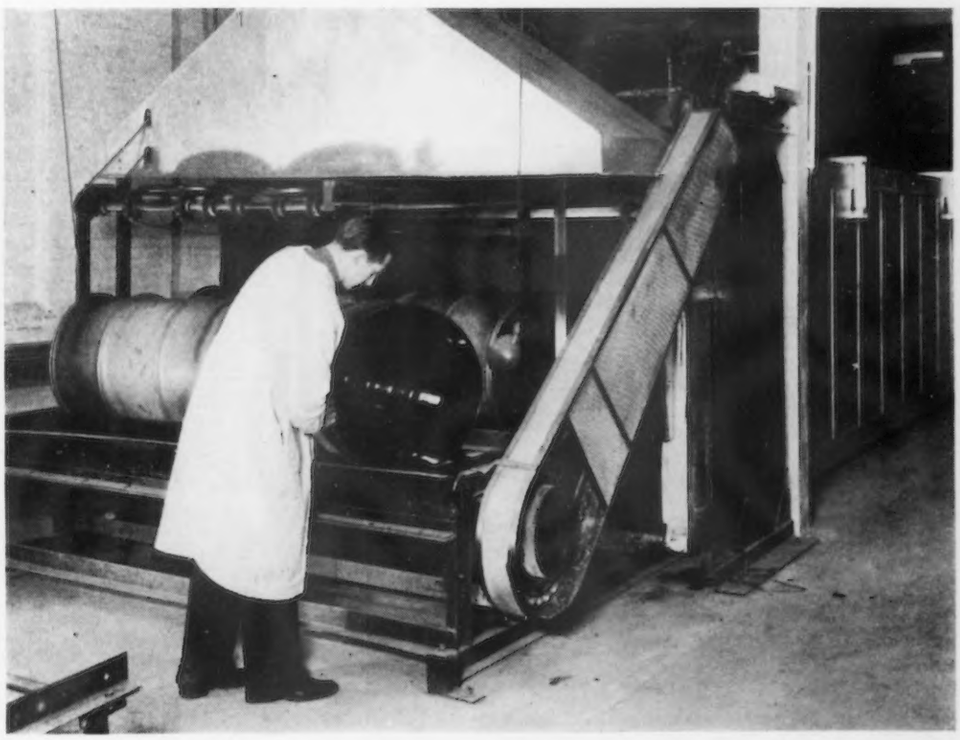
BARRELS being discharged from the interior coat baking oven. Directly under the hood is the small conveyor for handling barrel covers.



PACKARD is a name in the automotive world which has long been a symbol of quality. Until this year the Packard Motor Car Co. was identified only with the manufacture of cars in what is termed the high-price group. When it decided recently to broaden its line to include its One Hundred Twenty series of passenger cars in the medium-price class, it wished to maintain its reputation for putting materials and parts of the finest quality into its products. Accordingly, it spent several million dollars to install new equipment and to evolve new processes to assure maintenance of that quality at the lowest possible cost.

Two of its new installations consist of an atmosphere-controlled, gas-fired heat-treating furnace for carburizing axle shafts and a batch-type gas carburizing furnace for camshafts. The axle shaft equipment comprises a hardening furnace through which axle shafts are transported individually by conveyor, a washer and a draw furnace.

Axle shafts enter the furnace through a horizontal circular swinging door designed to prevent escape of the furnace atmosphere. They then meet a twin-type specially designed alloy-steel screw conveyor which carries them through the furnace. As the shafts enter the muffle, they fall between a pair of correlated flights of each screw on to four alloy steel supporting rails attached to the alloy steel muffle. These rails are located alongside the screws, one on either side. As the screws are rotated, shafts are advanced through the muffle while supported on the rails. The screws are geared together and driven by a chain drive.

Controlled Atmosphere Used

Internal width of the furnace is 3 ft. 6 in. and internal length 6 ft. Within this area is a gas-tight alloy muffle though which the shafts pass while being heated. In the muffle chamber a rich carbon monoxide atmosphere is maintained

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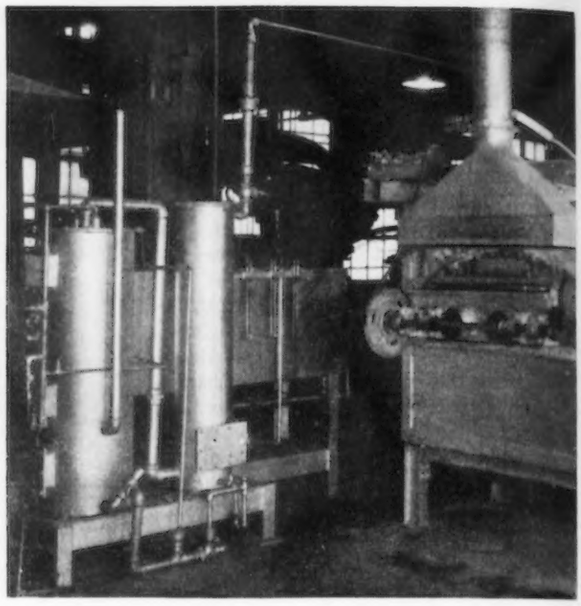

Packard Axle Shafts Carbu riz

to prevent scale formation on the shafts. This atmosphere is Surface Combustion DX gas prepared in a standard DX gas preparation machine. The furnace has a capacity for handling 520 lb. of steel an hour, or 40 axle shafts, which are heated from a cold state to 1540 deg. F. It takes 41 min. to heat the work to 1540 deg., after which it soaks for 10 min.

The shafts move on the conveyor

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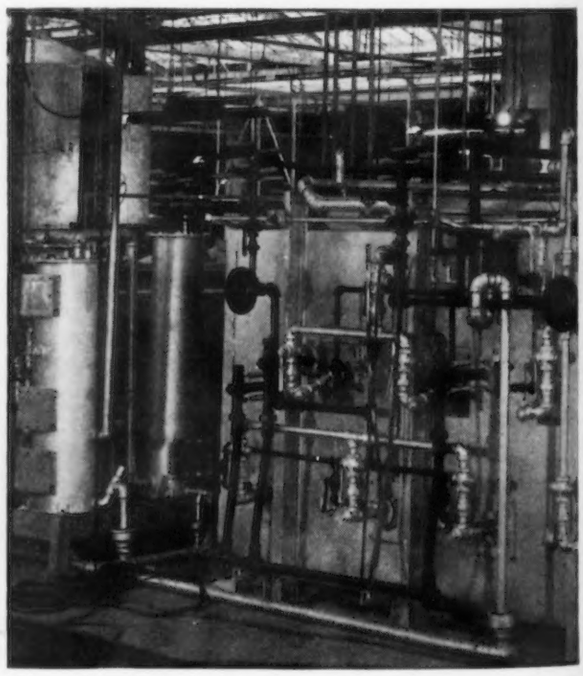

ABOVE

AXLE shafts pass on a conveyor through a gas-fired hardening furnace (foreground) at the rate of 40 an hour and thence through a quench tank, washing machine and draw furnace. Both furnaces are equipped with automatic temperature control.

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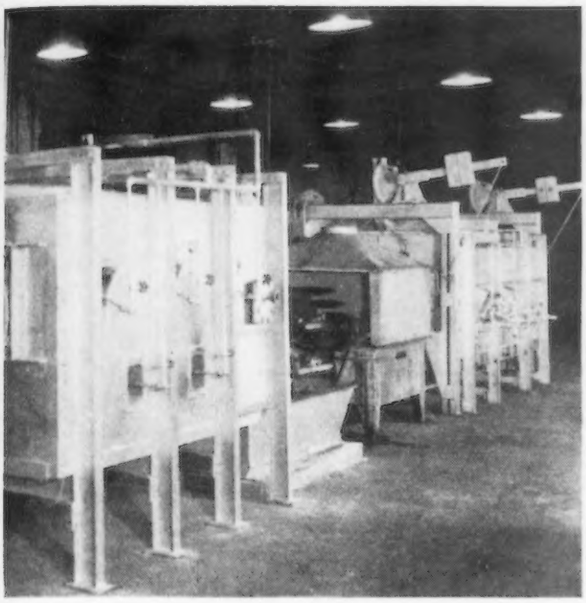

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rized In Gas-Fired Furnaces

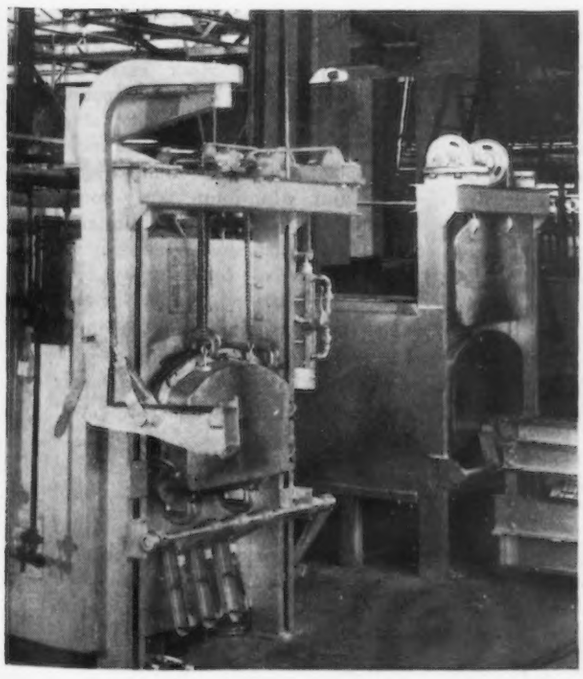
through the furnace to the discharge end, where they meet a mechanically-operated lowerator. The lowerator carefully lowers the shafts into the quenching medium, where they are deposited on the quench tank conveyors to be transported to the washing machine and then to the draw furnace.

The atmosphere hardening furnace is heated by standard low-pressure type velocity burners located along the side walls of the furnace and arranged to fire both above and below the muffle. The draw furnace is heated by the same type of burners placed in the side walls and arranged to fire into individual ducts beneath the conveyor in the furnace chamber. A portion of the burned gases is recirculated within the chamber, thereby affording uniform distribution of heat in any cross section of the furnace. The heating cycle is 50 min., shafts being heated to 850 deg. F. and soaked 40 min. Both the hardening and draw furnaces are equipped with automatic temperature controls.

A "Eutectrol" horizontal batch gas carburizing furnace is used to carburize camshafts. Shafts are loaded on trays which are placed in the cast alloy muffle of the furnace, the maximum net charge being about 1694 lb. Here the shafts are surrounded by a "CG" carburizing gas atmosphere provided by a Surface Combustion "CG" gas machine. The muffle is 31 in. wide, 7½ ft. long and 10 in. high from the top of the skid rails to the spring of the muffle. It is heated by standard low pressure velocity burners mounted in the side walls and firing both above and below the muffle.

After the material (trays and camshafts) has been heated to 1700 deg. F., it is held 9 hr. to secure a case depth of 0.07 in. Since 4 hr. is required for heating, 70 camshafts weighing 19 lb. each and 15 camshafts weighing 22 lb. each can be carburized on a 13-hr. cycle.

At the end of the cycle, the work is transferred to a special transfer table which takes it to the cooling chamber. This unit consists of two cast steel muffle sections, each of the same size as provided for the carburizing furnace, mounted on a structural steel frame, with rails to facilitate loading and a door which closes tightly. When camshafts are placed in this chamber to cool, CG atmosphere is introduced during the cooling period.



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AT LEFT

CAMSHAFTS are carburized in a Eutectrol horizontal batch gas carburizing furnace. At the end of the 13-hr. carburizing cycle, the work is moved on a special transfer table to the cooling chamber (extreme right).

o o o

Is the Technique of Iron and Steel

By JOSEPH F. SHADGEN
Ing. A.M.M., New York

IN time of depression the critics are in the saddle. Not only are established economic and commercial practices attacked, but the question mark is also put to existing productive technique. Only recently the iron and steel industry was subjected to a scathing indictment for its alleged backwardness in the development of processes and equipment.

This attack by outsiders is answered in this article by one who has long had an intimate knowledge of technical problems involved in iron and steel making. The author concludes that revolutionary changes in processes and equipment are unlikely, but that accumulated obsolescence due to the economic conditions of the past five years will stimulate the improvement and refinement of established methods.

THE ebb and flow of business not only disturbs the commercial mind but is also prone to undermine faith in technical processes. The depression valleys, with their apparently bottomless despair, are full of human reactions just as are the boom peaks with their apparently limitless buoyancy; but these manifestations should be tempered and restrained when applied to the scientific background of the iron and steel industry, whose foundations are sound and will withstand passing doubt.

All steel-making processes have a definite chemical character. Physics, heat and electricity are the handmaids of the fundamentally chemical transformations from ores to finished products. The knowledge of chemistry is considered a necessity to all interested in metallurgy, of which iron and steel manufacturing is one of the most important branches. Hardly anyone will deny the extreme usefulness of the basic chemical science and its countless valuable contributions to the progress and evolution of the whole industry.

Many will wonder why these commonplace statements are made. This is the reason: Recently outside, self-appointed critics accused the iron and steel technologist of even greater backwardness than the New Dealer attributes to the rugged individualist of the pre-Roosevelt era. As the chemical point of view was used as the keynote of the attack on the industry, the readers of THE IRON AGE are reminded of obvious truths and facts in order to restore their peace of mind as well as their mental balance. Broadsides of the nature referred to usually miss their often well-intentioned aim on account of the sweeping nature of their condemnations, the lack of specific details in their suggestions and the neglect of economic considerations that dictate in last analysis all practical solutions.

The economic angle is, of course, the most important and can never be lost sight of. Steel prices are low and costs must be compressed —those are two inescapable laws that govern all decisions in the steel trade.

Most trade figures of iron products are quoted in ton lots, while the majority of other materials and chemicals are quoted in pound lots. Ores, limestone, coke, slag, pig iron and steel are tonnage products, while zinc and copper, lead and aluminum are pound products. By comparison pig iron is ¾c. per lb., steel 1½c. per lb. (1¾ to 2¼c. for shapes), as against 9c. for copper, 4c. for zinc and 19c. for aluminum in ingot form. The yearly production statistics of the non-ferrous metals are in "pounds" as against "tons" for the ferrous group.

The inevitable corollaries of large quantities are low prices and small margins in transformation costs. All processes must be economical and efficient to survive the exacting demands of competition. All frills and fancies have long been eliminated in the back-break-

Making Laggard?

Let's Look at the Record

ing routine of feeding the never satisfied appetites of Gargantuan furnaces and the arduous labors of handling of thousands of tons of products. Essentials are quickly recognized and appreciated owing to their contributing values in dollars and cents.

The preferred formula to reduce conversion costs in the various iron and steel-making processes has been to increase the size of the production unit. As a result, imposing blast furnaces silhouette the horizons with their gigantic hoists, stacks, stoves and pipe lines, and these are usually complemented by massive coke oven batteries and seemingly endless rows of furnaces and mills. Unit production from 500 to 1000 tons per day may sound commonplace, but these figures are large, sometimes uncomfortably so, in any language and in any industry and in any country.

The natural drawback of this trend toward size is *inflexibility* and *predominance of investment burden* compared with *operating expenses*. This is the real reason for the conservatism of the industry, which is often called backwardness by its critics.

Research on Pilot Plant Scale

As the industry comprises only a comparatively small number of large corporations, the above condition prompts the suggestion that one plant be set aside as *pilot* plant for experimentation, to explore and find out what is good, what is not so good and what is bad. The results of trials carried to a conclusion in the pilot plant could be transferred to the other plants with the least disturbance. Well directed research on plant-size scale eliminates many errors due to size, etc., and reduces human interference to a minimum. It is surprising to note that the well-integrated business units of the industry have arrived at a policy of this sort, since such a move would stop endless personal controversies and would eliminate the natural disparity between operation and research, between repetition and exploration, between the positive knowledge and the desire to find new limits and to pioneer the unknown. It is not only good common sense but also excellent business judgment to consider research a necessary adjunct, to keep abreast and to look ahead. So many of the scientific fields remain hazy and mysterious that there is no danger of running out of problems. Neither is there a scarcity of exploring talent.

Production Steps Are Logical

The iron and steel industry is subdivided into two large producing departments—the reducing of the ores to pig iron and the refining of the pig or scrap into iron and steel. The first step concentrates ores with an Fe content varying from 27 per cent to 50 per cent to pig iron with 93 to 95 per cent Fe. The second step jumps from this limit to an average of 99 per cent Fe more or less.

Is this "step" procedure logical? The answer is yes. No better procedure is now available. No fundamental improvement is in sight to upset this method of making steel. Pig iron is not only an economical final product in itself but also an economical transition product as well. It has a steady, fixed analysis and a definite, comparatively low melting point; it is offered in less than 10 varieties of definite composition; it is easily produced in an efficient shaft furnace, characterized by automatic operation features that are unusual.

All efforts to circumvent the blast furnace have failed to date. Yet millions have been spent in the United States and in Europe in many attempts during the past half century. These experiments were not in vain, although most of them were carried on under the veils of mystery. It has always been the habit of the steel industry to bury its dead in silence. The medical profession is more practical in this respect; it studies the causes of deaths and often makes postmortem investigations to avoid repetition of mistakes in the future and to draw definite conclusions from the lessons of the past for the benefit of the public.

Blast Furnaces Very Efficient

The so-called direct reduction processes, aiming at making iron of low-carbon content (less than 1.0 per cent C) in spongy, granulated form as compared with pig iron with an average of 3.5 per cent C in molten, liquid form have their theoretical fascination but also their

practical headaches. The coexistence of the various reducing reactions between ore and stone, air, gas and coke are very definite in their temperature (heat potential) balance as well as in their B.t.u. (heat quantity) equilibrium in the shaft furnace with its great height, its hermetic tightness, its countercurrent principle, its intimate mixture of solids and gases and its progressive zones.

The blast furnace will be hard to beat by any other device. The pig iron, melting at comparatively low temperatures (2250 deg. to 2200 deg. F. average), is a heavy eutectic solution that quickly and easily separates from the lighter slags, fluid at the same temperature, with minimum loss of iron (about ½ per cent) in the slags.

In Fig. 1 the material balance of an average blast furnace is given corresponding to American standard operation. It appears that 7 lb. of materials are handled to produce 1 lb. of pig iron. About 2.45 lb. of burden (ore and stone), a little less than 1 lb. of coke and about 3.75 lb. of air. The products are 1 lb. of iron, about 0.6 lb. of slag and 5.40 lb. of gases. This picture focuses the attention on the 3 lb. of nitrogen that has to be handled without change for every pound of pig iron produced.

The suggestion has often been made to eliminate this burdensome handling of the nitrogen because it is apparently valueless. This looks quite possible at least on paper as the art of concentrating the oxygen of the air has progressed in the past decades to a high degree of efficiency. The first and main handicap in translating this suggestion into brick and mortar is cost. The volumes of air to be treated are beyond the size of any commercial installation existing at present. Second, it is very questionable whether the blast furnance process itself would be improved by removing the flywheel effect of the nitrogen. The temperature balance in all probability would be so disturbed that it is hard to foretell what would happen. One thing is sure, the present operating conditions are right in the Co/Co_2 ratio as well as in the temperature zoning, and nobody can guarantee that these conditions would be equalled by the use of air of enriched oxygen content.

The third consideration in favor of maintaining the nitrogen flywheel is the cheapness of the air. While the air weights are large expenses in pounds they are small when expressed in dollar values; hence, the cost margin to be gained is in reality small compared with the possible advantages and its concurrent risks. In the dollar balance of the raw materials per ton of pig iron the ores average some $5 to $5.50, the coke $3 to $3.50, the limestone less than $1 and the air less than 50c., summing up to an overall total of $10 per ton. Of course the advocates of radical changes infer that the coke rate will be materially reduced at the same time. But this is only an inference and not at all certain—not at all established in an indisputable way by an analysis of the underlying chemical reactions.

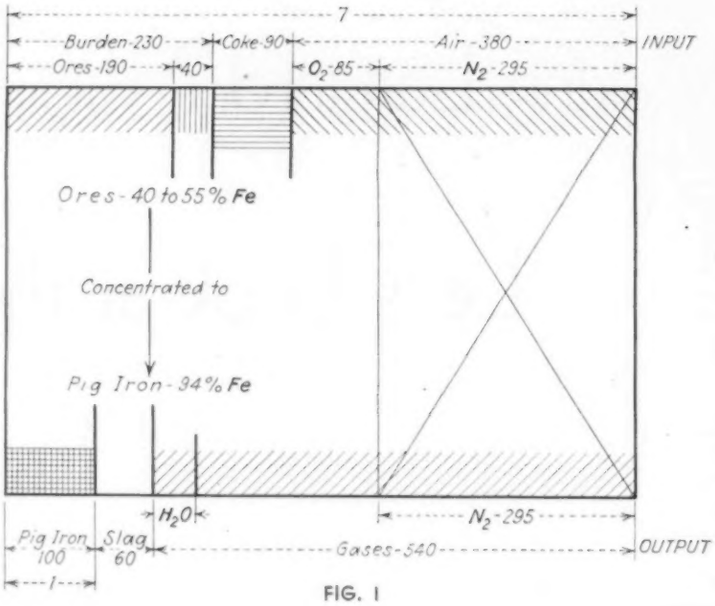


FIG. 1

In conclusion it may be said that these various considerations have enough weight to postpone any attempt of operating a blast furnace on concentrated oxygen if not indefinitely, at least to a later, remote date.

The blast furnace process is continuous. The charging is done in definite cycles with great regularity to assure the mixing of burden and fuel in their downward path. The injection of the air under pressure through the bustle pipes and tuyere nozzle is practically continuous, as is the take-off of the gases except for a few short interruptions now and then.

The bleeding off of the slag is intermittent. The slag hole, being water-cooled, presents a definite orifice that can be easily plugged. The cycle of slag runs is mainly determined by the slag cars available, their size or the uses to which slag is put, and the judgment of the operator on how much slag gives the best flywheel results. In the low-grade ore districts with burden yields of 28 to 35 per cent the slag volume is so large that the tapping is practically continuous. There is no gain in economy of operation to be expected from this angle.

The removal of the pig iron itself is intermittent for various reasons: first, the tap hole and its troubles; second, the size of the ladle cars to remove the product; third, the necessity of giving the operator an element of control over the operation. The periods between tapping vary from 4 to 6-hr. intervals down to one hour. If the tap hole is in good shape, four or five ladles of 50 to 100 tons can be filled one after the other without trouble, but if the refractory hole is in poor shape, the whole furnace has to be stopped while repairs at this vital spot are made. It is during those moments that the helplessness of the operator stalks everybody in the face and

FIG. 1—Material balance of blast furnace, with combustion of air generating 26 million B.t.u. per ton (2000 lb.) of pig iron, melting at 2150 deg. F. Note: All figures are rounded and represent average operating conditions.

o o o

FIG. 2—Material balance of typical open-hearth furnace, with air combustion generating 4.5 million B.t.u. per ton (2000 lb.) of steel, melting at 2650 deg. F. Note: Round figures are used and represent average operating conditions. Increased fuel consumption moves line **AB** further to the right to **A'B'** or **A"B"**.

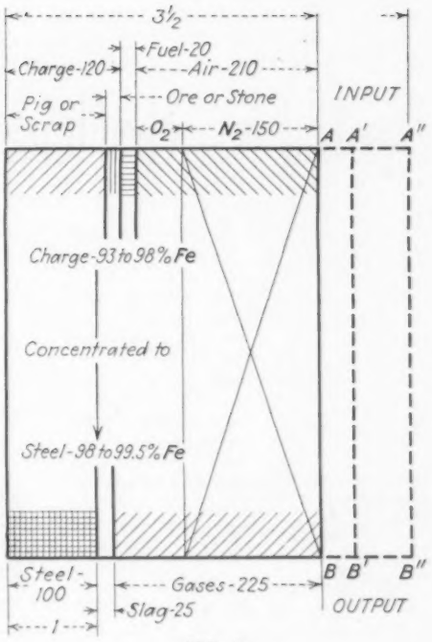


FIG. 2

makes all paper suggestions look very, very pale; they bring forth pious wishes, punctuated by harsh words, for better refractory materials.

Here is a real need: better materials resisting heat, erosion, corrosion, wear and tear, slagging reactions and so forth. The refractory makers have made considerable progress toward uniformity of quantity, accuracy of shapes, control of raw materials and kilning temperature but there seems to be room for further improvement. Too many theoretically known facts are buried in the laboratories while they should be currently applied in the mixing rooms and yards of the refractory manufacturers.

Progress in Auxiliaries and By-Products

In surveying blast furnace developments, the greatest progress is noticed in the mechanical departments—hoists, blowing engines and accessory machinery—and in the heat utilization of the gases. The humidity of the air—2 to 3 lb. out of the 375 lb. needed for 100 lb. of pig iron—is forgotten today, yet it was in the spotlight 20 or 30 years ago. The temperature of the blast air increased slowly but surely and averages today 1100 deg. to 1400 deg. F. The stoves increased their efficiency from 40 per cent to 75 per cent but remained unchanged in principle—huge masses of bricks built on the regenerative principle and used in cycles on gas and on blast—in conjunction with a continuous furnace operation.

Here is a definite, well-circumscribed problem that has been neglected, especially if compared with the achievement in other branches of the heat transfer science. The dollar efficiency of modern blast stoves is very low. The cumbersome equipment with many leaks and miles of big pipe lacks unity, directness and proper coordination. The volume-flow angle, as well as the heat-flow point of view, are given poor consideration to say the least. Here is a specific weak spot in the armor of the blast furnace process that needs immediate attention and imaginative redesigning, incorporating all research data available today to the heat technician.

Blast furnace gas, which was changed from an outright waste product 50 years ago to a useful by-product 25 years ago, has become a valuable main product today. The cleaning problem has been satisfactorily solved during the past decades although minor improvements are still possible. Utilization of the gas as a fuel in metallurgical furnaces and ovens, etc., is in full swing today because its advantages as a heat source are more and more appreciated.

The second step in making steel products is the refining operation from pig iron or scrap to finished steel. The progressive elimination of 4 to 7 per cent impurities increased the melting point of the iron from about 2200 deg. to 2700 deg. or more. This is the outstanding fundamental characteristic in which center most of the practical difficulties.

There are three major steelmaking processes. Converter blowing was originated by Bessemer about 1850 with acid linings and by Thomas-Gilchrist around 1885 with basic linings. This operation is done in 15 to 40 min. and is applied to batches of 15 to 40 tons. Large volumes of cold air are blown under pressure through the molten pig iron and burn the Mn, C, Si, S and P; these reactions release heat that raises the bath temperature sufficiently to assure practical control and success. About 25 to 30 per cent of the world production of steel is made by this method. The Bessemer converter lost its popularity because phosphor-free ores are necessary but scarce; the silica-type refractory lining of its vessel does not permit scorification of phosphorus. The Thomas converter made possible the enormous development of the Luxemburg-Lorraine iron and steel industry because the minette ores contain several per cent of phosphorus. This element is eliminated by the basic lining of the Thomas vessels and additions to the charge.

Siemens-Martin or open-hearth furnaces have either acid or basic linings. This is the most important steel-making process and is responsible for over 60 to 65 per cent of the world's production. The open-hearth process is the most economical method of steel making under present conditions. The main reasons are flexibility and control.

There is flexibility in choice of raw materials—pig iron or scrap, solid or liquid, any analysis, ore additions or limestone additions, alloys, etc.

In control of operations there is progressive elimination of impurities, refining to any desired degree, choice of reagents, regulation of temperatures, etc.

The third method of refining steel is electric furnace melting. In this case heat is furnished by the ohm law or the Maxwell effect or the arc. This method is confined to quality products and alloys under present conditions.

(CONTINUED ON PAGE 104)

Influence of Roll

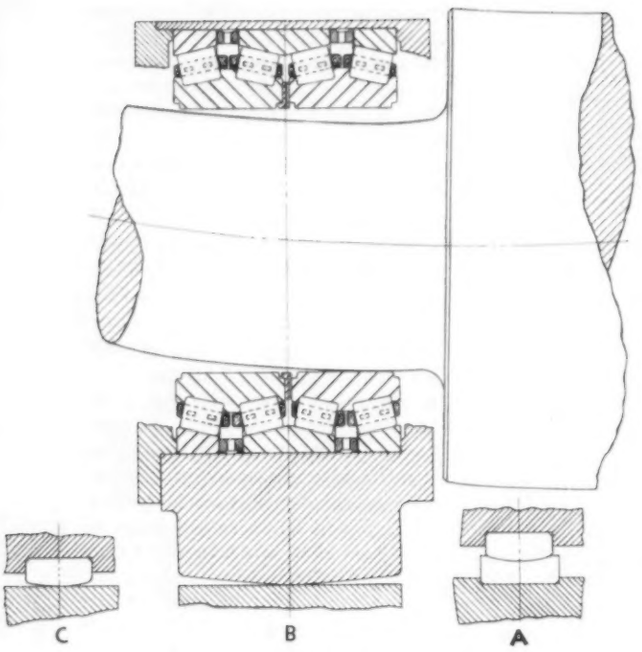


FIG. 1—If a bearing housing does not self-align when the roll deflects, the load is carried on the edge on the bearing nearest the roll body, as shown in this exaggerated view (B). Design at (A) shows sliding device to permit chock movement, and (C) shows knife edge device to permit chock deflection.

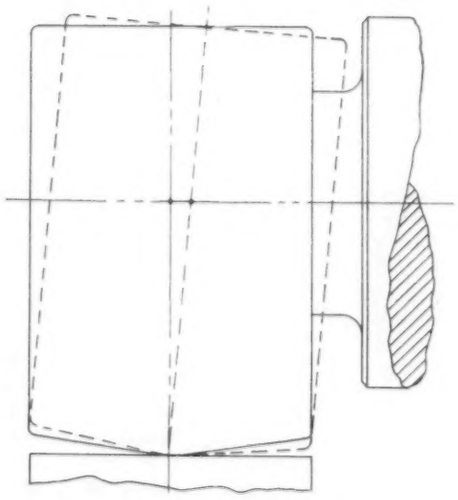


FIG. 2—Detailed analysis of action of the (C) arrangement of Fig. 1. Considering the horizontal displacement of the bearing center, it would be necessary for the roll to shorten in order to obtain rocking action.

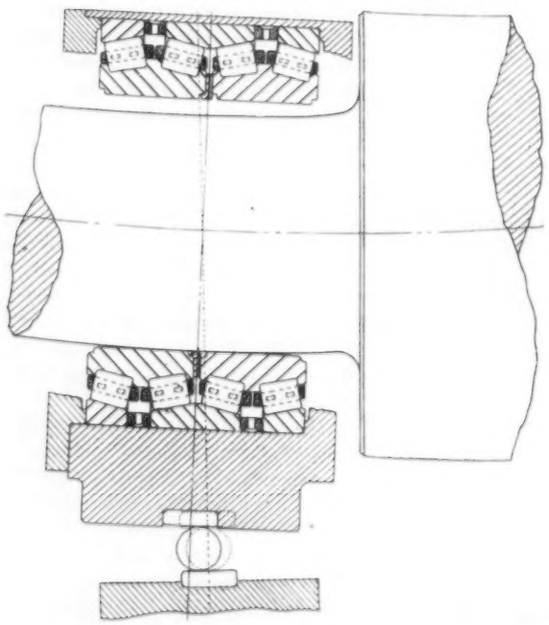


FIG. 3—Roller (at bottom) permits the outward motion of the load side of chock and the tilting of the chock to compensate for angularity of roll neck.

DURING the developmental period of mounting anti-friction bearings on rolling mill necks, a considerable amount of trouble was experienced. Many of these older mills, although since revised, continue to show poor bearing life, and there are several reasons for the trouble.

Rolling pressures were calculated from a relatively small amount of measured data. Methods of pressure measurement were less advanced than at present, and there is still much room for improvement.

Operators quickly discovered the economic possibilities of more severe rolling with anti-friction bearings with the result that rolling schedules quickly exceeded the capacity of the equipment. This condition still exists and probably always will. And the problem is particularly severe at this time with so many new alloys being brought into commercial importance and with the methods of rolling them still in more or less experimental stages.

However, the greatest difficulty with bearings has been caused by a lack of appreciation of the severe effect of roll neck deflection on bearing life. This causes concentration of the load on a small portion of the bearing and is the major cause of roll neck bearing failure today as it has been in the past.

As a result of the failure to compensate for this condition, it has often been necessary to continually increase the size of roll neck bearings until the capacity of the bearings has become sufficiently great

*Presented before the convention of Iron and Steel Electrical Engineers, Youngstown, Ohio, April 25, by A. H. Frauenthal, of the Bantam Ball Bearing Co.

Neck Deflection on Bearing Life*

that a small portion of the bearing is capable of carrying the entire load. This practice results in larger roll diameters and increase of other mill parts in proportion so that it now seems that each succeeding mill is larger than the last built for the same general purpose.

Roll diameters have already reached the point where their production in the foundry is a major problem and, in one case at least, more than a year's experience in producing a certain size roll has not resulted in the ability to produce successful rolls on the first attempt. Furthermore, larger rolls are constantly being considered to the extent that will at least greatly tax the present status of roll foundry practice. This idea was previously expressed in May, 1932, by Lloyd Jones in a paper before this society.

It seems clear that if roll neck bearings can be arranged so that the entire bearing instead of only a small portion is operative, that much smaller bearings can be used to give satisfactory life. Likewise, the life of large size bearings already in use on the most modern mills will be greatly lengthened.

Therefore the economy resulting from this condition is self-evident.

An examination of bearings that have been in service, especially on bottom rolls, usually shows that the greatest portion of the rolling load has been carried on a short length of the bearing. This short length is located toward the inside of the mill and is the portion of the bearing nearest the roll barrel.

The reason for this lies in the fact that the rolling load produces a considerable deflection in the roll body and especially in the roll neck,

WHEN a roll deflects under load, the roll neck also deflects. Thus some provisions should be made in order that there will not be a concentration of load on part of one bearing during this deflection. The author herein describes a new development of the Bantam Ball Bearing Co.—a roller aligner—which is claimed to compensate automatically for varying deflections of roll necks and to keep loads evenly distributed at all times. This action is said to result in much longer roller life and greater protection for both bearings and rolls.

with the result that if the bearing housing does not self-align the load is carried on the edge of the bearing nearest the roll body, as shown in the exaggerated drawing in Fig. 1. This condition is now so universally recognized that various devices have been tried to provide some means for self-alignment of the chock to bring the angle of the bearing coincident with the angle of the neck.

Favors Knife Edge Mounting

On the early mills the chock bottoms were flat, and these flat bottoms operated on the flat bottom of the housing window. Obviously this permitted no self-alignment of the chock. The several designs used to improve this condition while differing in detail fall into one of the three classes shown in Fig. 1.

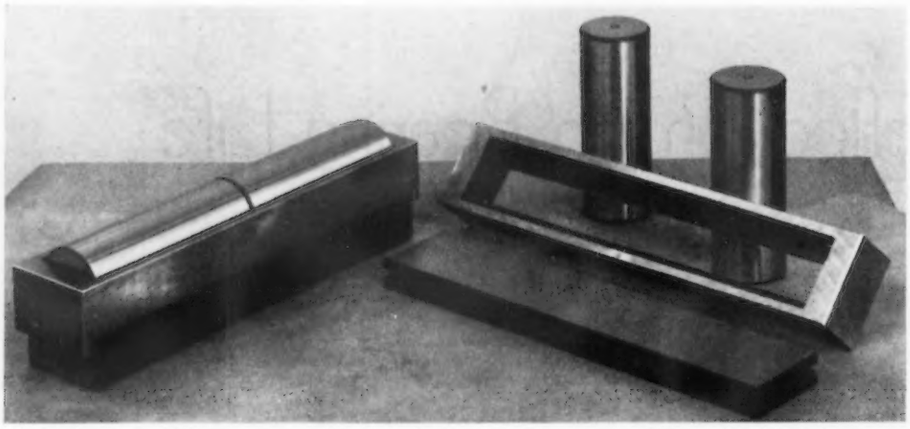
The method shown at *A* requires a sliding of the male spherical block in the female spherical block to permit chock movement. This sliding often never takes place due to the extremely high friction. Any attempt to lubricate these surfaces usually fails because of lack of the fundamental requirements for the formation of an oil film.

The method shown at *B* is a virtual knife edge and, in common with the method shown at *C*, has as its object a rocking action to permit the same angularity in the chock as the deflected roll neck. A simple analysis of this action is shown in Fig. 2, from which it is clear from the horizontal displacement of the bearing center that to obtain rocking action it would be necessary for the roll to shorten. As this is impossible no rocking action can take place.

To obtain self-alignment it is necessary for the bottom of the chock to move outward by sliding on the housing under load. Again it is obvious that friction is too high for any such sliding to take place. Numerous observations of a number of mills, both wide and narrow, show that there is no sliding.

However, compared with the old method of mounting a flat bottom chock on the flat bottom of the window, it is believed there is considerable value to the knife edge mounting.

Without the knife edge, that is, with the chock supported on the bottom for its entire length, the deformation of the chock under the concentrated load on the end of the bearing is limited to the elasticity of the column of metal under compression, and experience has shown that this mounting usually results in rapid bearing failure.



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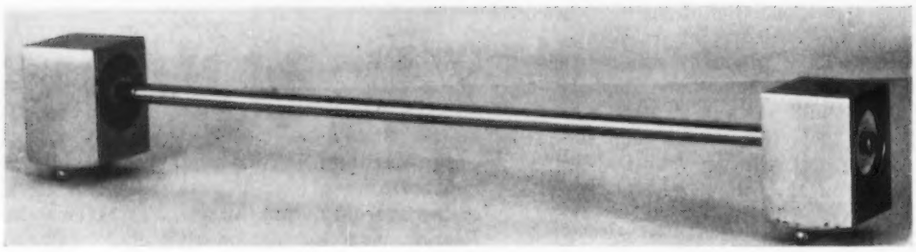
AT LEFT

FIG. 5—Principal parts of the roller aligner. Plate and rollers are of hardened high-carbon chromium steel. Rollers are held in a cast bronze cage so designed as to hold lubricant and to limit endwise motion.

AT RIGHT

FIG. 4—Model to show action of roll aligner. The insertion of a roller under each chock permits the chock to rock with varying roll deflections.



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When the chock is made knife edge, the inside end of the bottom is not supported by the mill housing and consequently the deformation of the chock is only limited by the much greater elasticity of the considerable length of metal under tension. Thus stretching takes place and relieves the concentration of stress thereby improving bearing life. This explains why in some cases better bearing life is obtained in old mills where the chock is rather thin on the load side than in more modern mills having very thick chocks on the load side.

Another method of construction for heavy mills is that of two self-aligning bearings mounted on the same neck. To obtain self-alignment of the chock it is necessary for the outer races to move endwise against static friction under load. For a chock to self-align it is necessary in every case to overcome static friction under the mill load and in every case the friction load is far too high. For a bottom chock to self-align it is necessary for the bottom to move outward and this can only be accomplished by anti-friction means.

A device of this nature has been developed by the Bantam Ball Bearing Co., and consists of a single roller located between hardened plates on the center line of the bearing transverse to the axes of the rolls. Fig. 3 shows how this roller permits the outward motion of the load side of the chock and the tilting of the chock to produce an angularity of the bearing and its housing to exactly compensate for the angularity of the roll neck. It will be noted that the bearing center is not displaced and that the chock clamp can be placed at a neutral point where it will not interfere with the action.

It is obvious from the anti-friction nature of the device that it will be impossible to place a heavier load on one end of the bearing than the other without tilting or self-aligning the chock. This fact should be particularly borne in mind when it is further considered that the curvature of the roll neck as well as the angularity tends in the conventional mounting to concentrate the load on the bearing.

A model has been constructed to demonstrate the poor distribution of load with the conventional mounting and the correction of this condition by use of the Bantam roller aligner. The model shown in Fig. 4, consists of two small replicas of roller bearing chocks with knife edge load side in which the roller bearings have been replaced by rubber plugs. A comparatively slender rod is used to represent the roll in order that it can be readily deflected for demonstration purposes by hand pressure.

When the roll is deflected the chock does not rock, and the inside end of the rubber plug is severely deflected. Inserting a roller under the chock permits the chock to rock and relieves the deflection on the end of the rubber by carrying the load over its entire length.

Roll Can Expand or Contract

A secondary advantage of the roller aligner lies in its permitting expansion and contraction of the roll to take place on anti-friction motion. In the case of most straight roller bearing mountings, expansion and contraction takes place by sliding which is endwise across the rollers. While smaller in the case of straight roller bearings, the sliding friction involved introduces temporary heavy thrust loads. This is eliminated with the roller aligner and should result in an increase in life.

Main parts of the roller aligner are shown in the photograph, Fig. 5. The method of installing can be varied to suit various conditions, one design being shown in Fig. 6. In all cases the plates and rollers are hardened and ground Bantam high-carbon chromium electric furnace steel.

It will be noted that the top plate is set in a groove in the chock and held in position by a small clamp at each end engaging a groove in the end of the plate. The bottom of the chock extends below the rolling surface of the plate to protect it when the chock is standing on the floor.

The bottom plate is set on the bottom of the housing window and held in position sideways by the machined castings which also hold the centering springs. These centering springs and plungers are simply to hold the roller in a central position during mounting of the roll and chock into the mill, and are so constructed that they permit the roller to move in either direction.

The roller is held in a cast bronze cage which is so designed as to hold lubricant around the roller in the standard Bantom Lubricage design, and has a flange extending over the end of the bottom plate to limit endwise motion of the roller.

While the essential purpose of this device is to permit anti-friction self-alignment for the roller bearing, it will be noted that the roller can be designed to act as a safety device or breaker in case some accident temporarily throws the full horsepower of the drive or screw down motors into the mill.

In this emergency the roller would crush and in the arrangement shown the chock could drop ¼ in. before meeting a solid support. It is considered that this ¼ in. is sufficient to clearly indicate to the operator that something is wrong, and is not a sufficient distance to cause damage by one side dropping when the other does not. The necessity of sealing the device has not yet been established; however, a simple rubber coffer-dam has been devised.

It is sometimes questioned whether or not a single roller can support the whole load. It may be pointed out that in a bearing a large number of rollers are required to support the same load. However, it should be borne in mind that in a roller bearing a relatively small number of rollers are in the load carrying zone at any one time, and one roller carries most of the load in the load zone. This is shown in Fig. 7.

Furthermore, there is the factor of fatigue to consider in the roller bearing because of the relatively high rolling speeds and large number of stress reversals, whereas in the roller aligner the roller, because of its very small and infrequent motion, is under static load. It should also be considered that it is possible to use a roller much longer in a roller aligner than can be used in a roller bearing and likewise the diameter of the roller is only limited by the available space in the mill.

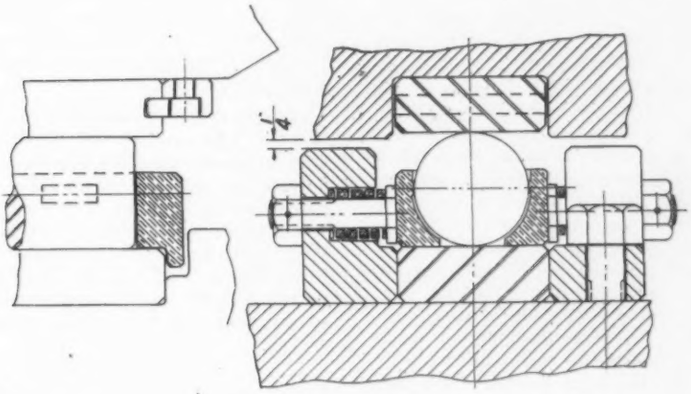

FIG. 6—One type of installation of the roll aligner. To the left is an end view showing the clamp holding the top plate in position. To the right is shown the complete roller setup, with centering springs and plungers.

Tests Very Satisfactory

While there are several ways of figuring the capacity of a single roller under load between flat plates, a single example by one method is given. For a 3,000,000-lb. load, a roller 5 in. in diameter by 24 in. long is used. Because a roller bearing of this capacity will usually have an outside diameter of over 40 in., there is space for a roller nearly 40-in. long, hence the above roller dimensions do not by any means indicate general limitations.

Tests conducted by the Bantam Ball Bearing Co. show that the ultimate crushing resistance of large diameter rollers is 100,000 lb. per sq. in. projected area. Considering the short roller above mentioned which has a projected area of 5 in. times 24 in. which equals 120 sq. in., the ultimate crushing resistance is 12,000,000 lb.

As this roller will only be stressed at 3,000,000 lb., there is a factor of safety of 4. Some six months' experience with this roller aligner has developed no trouble due to flattening of rollers or brinelling of plates, and there is usually space to permit a roller having about twice this safety factor.

While it is only possible at this time to give a preliminary report on the success of this device, it is interesting to note that readings taken with dial indicators show that under heavy loads, the chocks equipped with the Bantam roller aligner will self-align to an angle equivalent to ten thousandths of an inch (0.010 in.) per foot, whereas the same chocks with a conventional mounting and under the same load did not self-align at all.

This measurement was taken on a very wide mill. Similar measurements taken on a comparatively narrow mill (24 in.) showed a maximum chock angularity of 0.0125 in. per foot. This indicates that any greater stiffness in a narrow mill does not react to the advantage of the bearings so far as load distribution is concerned and the roller aligner is just as neces-

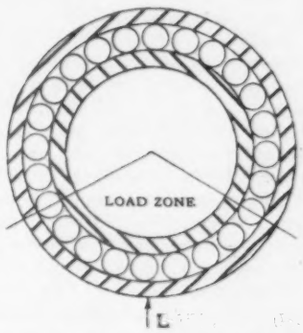

FIG. 7—Cross-section of roll neck bearing showing the relatively few rollers in the load carrying zone at any one time. One roller carries most of the load in this zone.

(CONTINUED ON PAGE 108)

Business Paper Editors Point Out Evils Of Proposed 30-hr. Week Legislation

WIDESPREAD strikes, general labor unrest, loss of business confidence and other effects likely to prove injurious to recovery may be expected if the proposed 30-hr. week bill, now sponsored by the American Federation of Labor, passes Congress. Such are the conclusions reached in a report just issued by the Committee on Labor Problems, representing 125 of the leading business and industrial publications of the United States.

This committee set out to ascertain what the direct effects of a rigid shortening of the work week would be. Significant among its findings is that labor costs would increase anywhere from 5 per cent to 300 per cent, depending largely upon man-hours required per unit of production. Its findings definitely indicate that just as the work week has been progressively shortened in the past through technological advance, so in the future a gradual further shortening of the hours that labor puts in may be expected. It showed clearly, however, that an effort to speed this trend through legislative fiat is almost certain to result in such heavy increases in the price of commodities that production will be curtailed and the longer term demand for labor demoralized.

Fear for the American standard of living is expressed. These editors who are intimately familiar with the economics as well as with the mechanics of production show that sound progress in the direction of a shorter work week is contingent upon the increased productivity of individual workmen. They point out that only if that productivity can be increased is it possible for employers to increase actual wages. More simply stated, they argue that any drastic adjustment in the ratio of labor cost to total manufacturing cost at this time would curtail rather than expand production.

Scarcity of highly skilled workers is shown to exist. With a shorter work week many industries would face a decided drop in efficiency if not an impossible production problem on this account.

While these editors concede that the immediate effects of such legislation might cause a flurry in increased employment, no such result can be expected to prevail permanently. The editors' report shows that the proposed legislation works at direct cross purposes with the Government's agricultural program and that adoption of the 30-hr. week would most certainly defeat efforts now being made to bring about more equitable production and prices of agricultural products as against the products of industry.

Some of the estimates of increased cost of merchandise that would have to follow adoption of the 30-hr. week which are included in this report are: 36c. in the price of overalls, 23c. in the price of workshirts, 75c. in the price of work shoes, $3 in the price of standard mattresses and $2 in the price of standard metal bedsteads.

The report itself sets up the proponents' arguments for the legislation, the economic factors that must be weighed in passing judgment upon such legislation, takes into consideration case studies made in such industries as coal mining, transportation and automobile production and concludes with a succinct summary of editorial opinion which is based upon contacts with every part of the business front.

Complete copies of this study are available at headquarters of the Associated Business Papers, 330 West Forty-second Street, New York, at a price of 10c.

Reinforcing Bar Delivery in New York Clarified—Other Code Resolutions

TRUCK delivery of concrete reinforcing bars from warehouses in New York and Newark and Jersey City, N. J., is clarified by Commercial Resolution A41, which was approved by the directors of the American Iron and Steel Institute, April 18, to become effective April 25. The resolution provides that if delivery is taken by a truck of the purchaser in those cities, the railroad freight station in said city may be used in figuring the delivered price and that no extra charge need be assessed for such truck service. It is further provided, however, that if the code member or accredited jobber loads such reinforcing bars on the purchaser's trucks, a charge of not less than 2½c. a 100 lb. shall be made.

Resolution A42, approved and made effective on the same dates, allows code members to omit handling charges in figuring the delivered prices of products for delivery at South Atlantic, Gulf or Pacific Coast ports or in Alaska or the Canal Zone when said products are for delivery in the switching limits of the designated port of delivery. An exception is allowed if transshipment is made directly or indirectly by the purchaser or agent thereof.

Resolution A43, also approved and made effective on the same dates, permits code members to make delivery of bars, plates, shapes, concrete bars and sheet steel piling by barge from the nearest freight station without assessing extra charges when products are used on inland waterways for Federal or State construction projects. If products are not unloaded within five days, however, the code member is required to collect $10 a day for the delay.

Resolution A35, covering reductions in delivered prices of certain wire products when such prices are determined on the basis of base prices at Gulf ports, has been revised to provide that such deductions shall not result in a delivered price lower than the all-rail published freight tariff on shipments of minimum carloads of 40,000 lb.

The Bantam Ball Bearing Co., South Bend, Ind., has had an increase in shipments for the first quarter of 1935 of approximately 50 per cent over the first quarter of 1934. This represents an increase of over 400 per cent over the corresponding period of 1933. Due to a steady increase in sales of heavy-duty bearings of the tapered roller and straight roller type for steel mill and other heavy-duty service, the company has increased its facilities for handling this type of work by 50 per cent within the last 90 days.

The New York offices of the Lukens Steel Co. were moved to new quarters at 2714-15 Chrysler Building, 405 Lexington Avenue, on April 27.

ALDUS C. HIGGINS, President, Norton Co.
Drawn by John Frew for The Iron Age.

Self-Alining Work Rolls For Four-High Mills*

By J. H. HITCHCOCK

Morgan Construction Co., Worcester, Mass.

A PREREQUISITE to the successful operation of 4-high mills is correct alinement of rolls. If either work roll is not parallel to its respective backing roll, rotation of the rolls under load produces a force which tends to move the work roll and backing roll endwise in opposite directions. Since the backing roll bearings are usually clamped more securely to the roll housings, the work roll in most cases is more likely to be moved. The magnitude of the axial force, determined by the vertical load and coefficient of friction between the rolls, as well as by the degree of misalinement, has been sufficient in numerous cases to rupture sturdy clamping devices and push a work roll completely out of the roll housing. It is conceivable, of course, that clamping dogs and bolts may be made strong enough to keep the rolls in place even with considerable misalinement, but in that event the forces resulting from misalinement produce unnecessary loads and dangerous stresses in the roll neck bearings. Consequently, misalinement of rolls is recognized as a very objectionable condition.

Positive Alinement of Rolls Assured

Positive alinement of rolls can be assured by use of the simple and ingenious device which is to be described. This self-alining device is illustrated in Fig. 1, which represents a horizontal section through a 4-high roll housing at the elevation of the pass line, looking down upon the lower work roll and its bearings. Each work roll bearing is mounted between parallel wedges, so arranged that axial movement of the roll changes the alinement of the roll axis. No restraint whatever is imposed upon the work roll bearings with respect to endwise movement, except that in moving they must follow the slightly diagonal paths established by the parallel wedges. The bearing casings are fitted at the sides with hardened steel plates having cylindrical outer surfaces. These cylindrical plates may be permitted to bear against the wedges themselves, in which case the wedges should be hardened; or auxiliary plates having cylindrical seats, as shown in Fig. 1, may be interposed to provide a wider surface of contact.

The operation of this self-alining device is based upon the principle that the forces which result from misalinement can be used to aline the rolls properly. From the foregoing statements it is evident that no appreciable axial force can be applied to the work roll without causing it to move endwise, carrying its bearings along between the parallel wedges. This endwise movement and the accompanying change of alinement, if the inclination of the parallel wedges is properly established, places the work roll in accurate alinement with its respective backing roll and eliminates the axial force which initiated the movement.

It is pertinent to note that the

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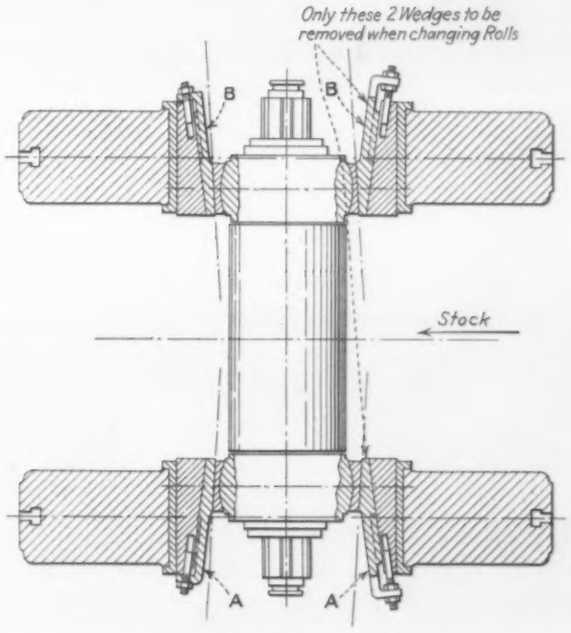


FIG. 1—Self-alining wedges for work roll bearings, shown at *A* and *B*. If rolls are skewed, the rotation of the rolls working the stock produces an axial force serving to line up the rolls. This arrangement is suitable for all types of bearings.

*Presented at the spring engineering conference of the Association of Iron and Steel Electrical Engineers, Youngstown, Ohio, April 24.

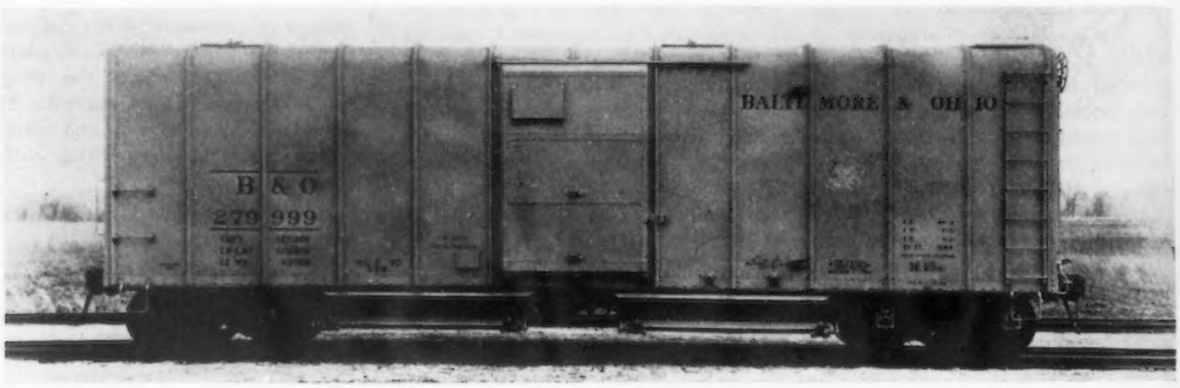
Experimental Freight Cars Feature

THIRTEEN new freight cars were recently built by the Baltimore and Ohio at its Mount Clare Shops, Baltimore, and eight of them were on display at Union Station, Washington, April 19 and 20. They embody many experimental features which, it is hoped, may in whole or in part point the way to improved construction and greater efficiency and economy.

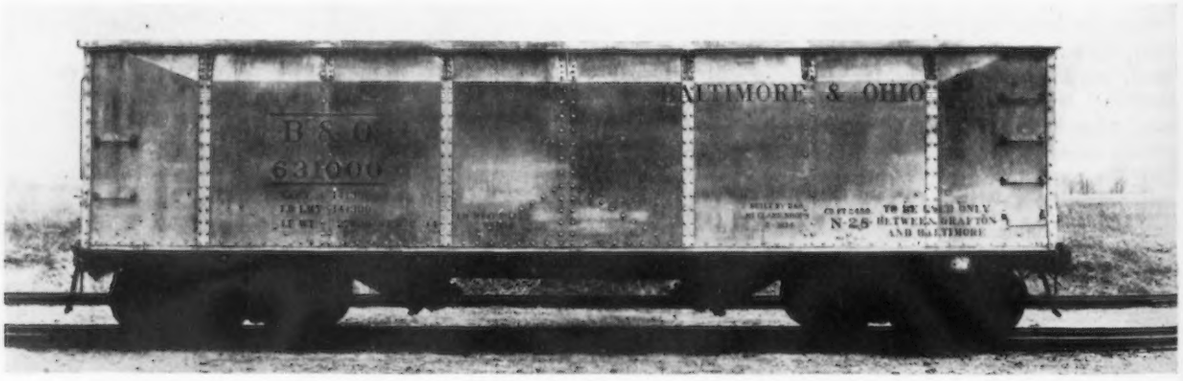
All the cars are built out of the new light but strong metal alloys. Generally, therefore, they have substantially larger ratios of pay load to tare weight, and also promise longer life because of the corrosion-resisting properties of the new metals. All of them also incorporate various new features as to underframes, brakes, couplers, etc., and some are so new in design and improved in operating flexibility as to mark a distinct advance in freight car construction.

The extent to which the new metals are used may be indicated by the body construction, consisting variously of Cor-ten, "A-W" 70-90 steel, Plykrome, rustless iron, double-strength steel, aluminum alloy. Some of the box car bodies are steel sheathed and lined with wood, while one has Masonite lining. Several of the same alloys and Man-ten are used in the underframes, and the same metal is also used in the sills of two of the cars.

The "Covered Wagon Top" box cars offer one of the most interesting innovations in design. In these the side and roof sheets are



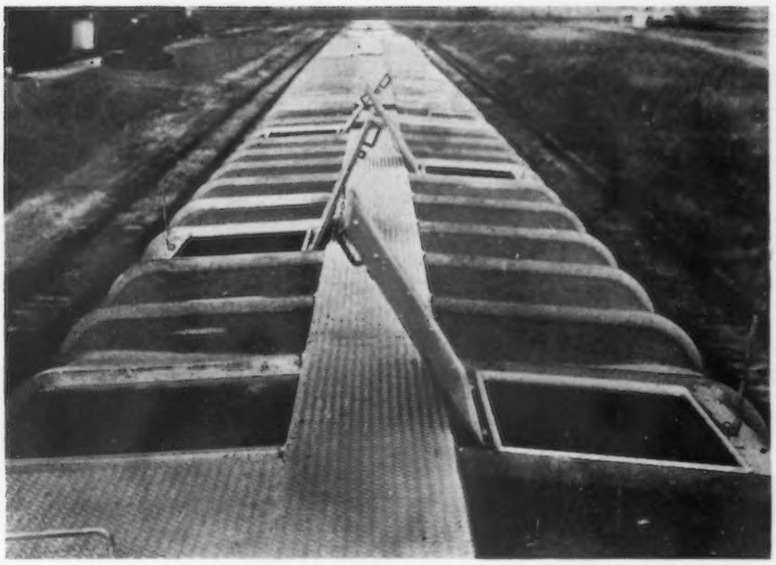
AMONG the experimental freight cars built by the Baltimore and Ohio Railroad is this covered wagon type box car. It has a revenue load capacity of 122,300 lb. and is provided with center hopper bottoms which discharge outside of the tracks, as well as end hoppers and roof doors. The body is steel sheathed and wood lined; the center sill is of Man-ten steel and hoppers are of Cor-ten steel.



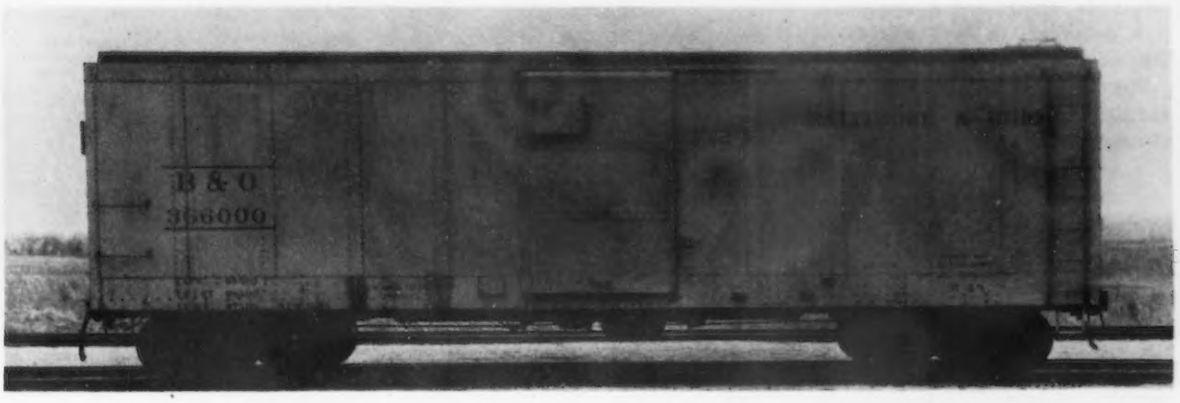
ALUMINUM was chosen for the construction of this hopper car, which has a revenue load capacity of 141,300 lb. The body is arranged with center and end hoppers and both body and underframe are constructed of aluminum alloy. The underframe is of the built up, "fish belly" type.

Light Alloys

integral, with graceful curve construction where the roof and sides meet, and bringing about increased cubical contents, greater strength and lower construction cost. In the actual building of a car of this type from a steel underframe, wood-body box car that had been shopped for a new body, improvements were made in no fewer than 22 respects, including a reduced cost of $100.86 as compared with the rebuilding of the wooden body, reduced tare weight with increased cubical capacity, and an increase

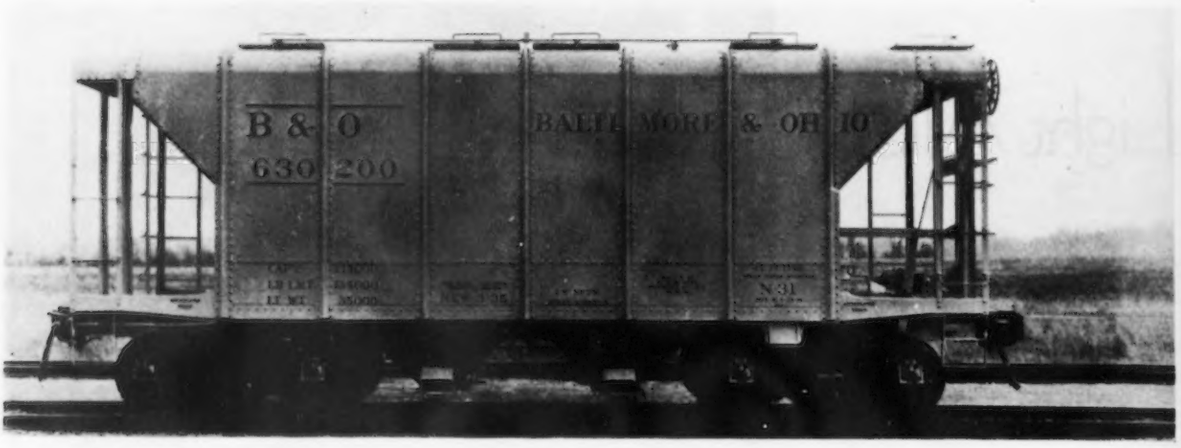


TOP of a covered wagon box car showing doors open in the roof. These provide for quick and economical loading, while the hoppers under the floor assure quick unloading of bulk materials.



WITH revenue load capacity of 98,500 lb., this box car is built of Cor-ten steel.

THIS B. & O. experimental hopper car, of 136,000 lb. revenue load capacity has a body made of Republic Double Strength steel. The underframe is of Man-ten steel.



HERE is a B. & O. experimental cement car, with revenue capacity of 134,000 lb. It has a covered wagon type body constructed of Alan Wood 70-90 steel with self-clearing hoppers. The underframe is made of Man-ten steel.

in the revenue carrying capacity from 92,600 to 126,000 lb., or 36.4 per cent. Other additional important economy factors are the lengthening of the service life of the car by 25 years, fewer shoppings for repairs and lesser repair cost, reduction of fire hazards to the car and to the lading.

The covered wagon box cars are also the most flexible for lading purposes ever built, being suitable for the economical lading of everything but liquids and unit pieces of such bulk as not to be able to be loaded through the side doors. Doors in the roof provide for lading, and under the hinged floors are automatic self-locking hopper doors which provide for quick unloading of bulk materials.

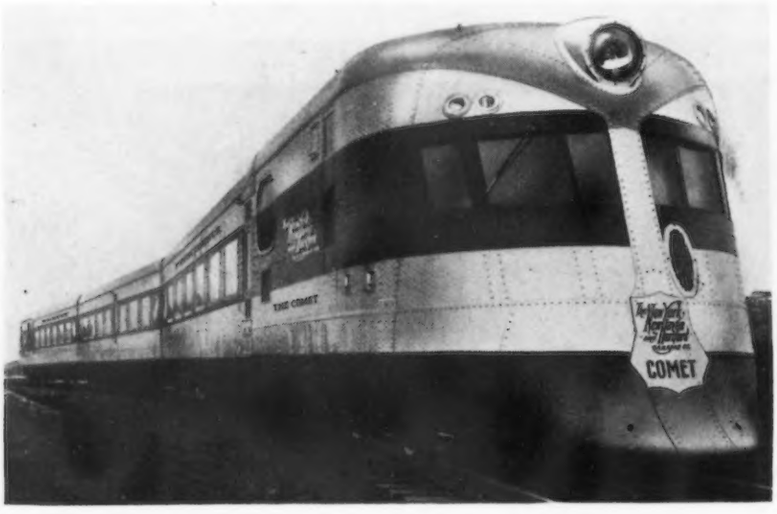
All these cars have been built for experimental purposes, and, since they incorporate in their construction the newest kinds of materials and devices, and are in many respects of the most advanced design, it is believed that they will indicate through actual service many ways in which freight car service can be made more efficient and economical.

Four of the cars have been in service for nearly six months, and have given most satisfactory service.

Streamline Train Built On Tubular Principle

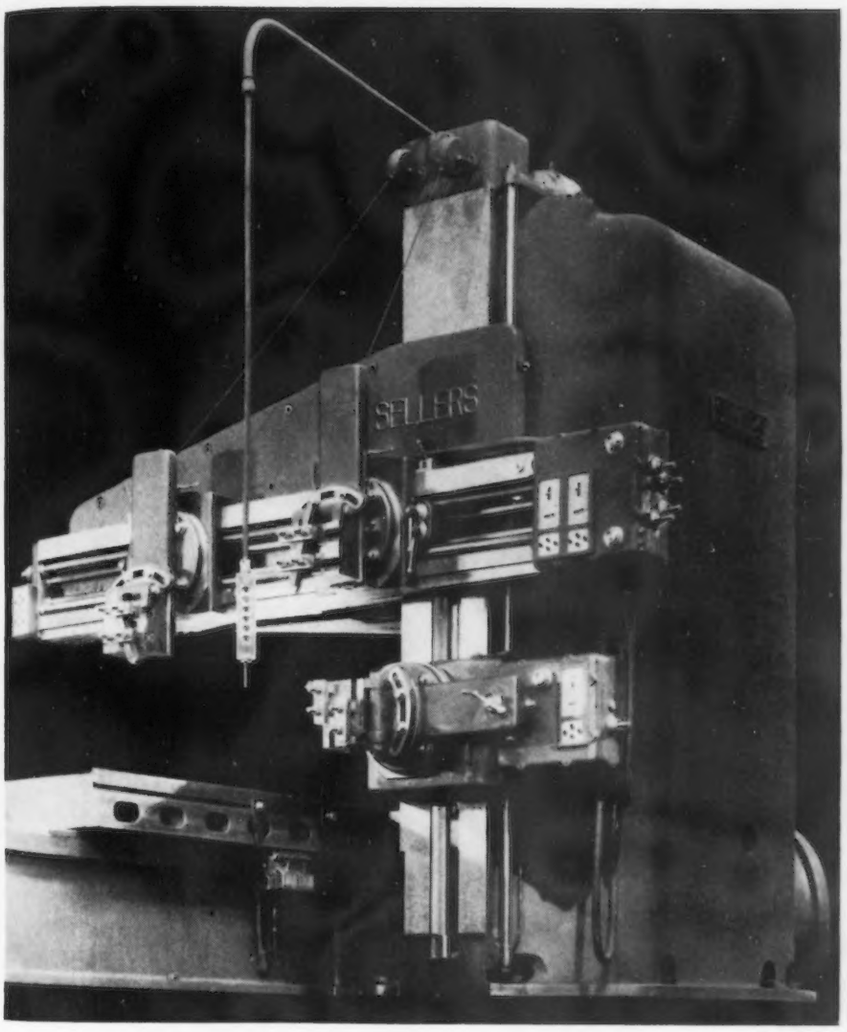
THE COMET, the latest streamlined passenger train to be completed, is constructed as a tube, with flat sides and well arched roof and bottom, and with shear and compression stresses absorbed by the outer surface or skin.

The tubular design, which is a departure from either the center sill or the truss principle of construction, was adapted from experience in airship fabrication by the builder, the Goodyear Zeppelin Corpn., Akron, Ohio. Constructed for the New York, New Haven & Hartford for high-speed service between Providence, R. I., and Boston, the train consists of three articulated units and has Westinghouse Diesel-electric power plants at both ends.



The train was constructed of aluminum alloy furnished by the Aluminum Co. of America. At points of articulation the body structure is connected by a heavy aluminum alloy bulkhead, the bottom part of which is formed by a welded high-tensile steel endsill.

In the engine rooms in the two end cars the underframe has been replaced by welded steel bed plates. Each of these is 20 ft. in length and 11 in. deep, formed by a top and bottom plate reinforced with longitudinal and transverse bulkheads, which provide a series of compartments for storing fuel, lubricating oil and water.



THIS view of the new Sellers 60 x 60 in. x 30 ft. openside planer shows the massive housing. The simplified cross-rail mechanism permits the housing to be of a shape that provides maximum rigidity to the face.

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Openside Planer Features Extensive Electrification

OPENSIDE planers, 60 in. and larger, of entirely new design, with a number of features worked out to simplify operation and improve performance, have been announced by William Sellers & Co., Inc., Philadelphia.

The machines are said to be the most completely electrified planers yet built. Simplicity is obtained by the use of individual motors for each head, the platen, rail elevating, clamp and lubricating pump drives. With inadvertent operation practically impossible safe operation, as well as high degree of operating convenience, is empnasized as an advantage of the complete electrification. Electrical features, developed in cooperation with engineers of the Westinghouse Electric & Mfg. Co., are outlined separately in the latter part of this article.

Design Simplified

From the accompanying illustrations it may be seen that the design is notably clean. There are no operating levers except those required for hand motions. All control is by means of "built-in" push buttons and switches. All bolts except those for clamping tools and for adjusting and clamping the heads are of socket head type and set into counterbores.

Bed and table are deep and heavy. The drive from the motor to the table is by spiral pinion, rack and one pair of helical gears. Thrust on the drive shaft is taken on anti-friction bearings arranged so that change in temperature will not affect the adjustment. Table ways are lubricated automatically by a pump which supplies filtered oil at two places in each way. The main drive motor is of new design and has 10 to 1 speed range, as explained below. Use of limit switches instead of master switch for automatic reversal has eliminated the necessity for any shifting levels or mechanism that might be a source of trouble at high speed.

Massive Housing

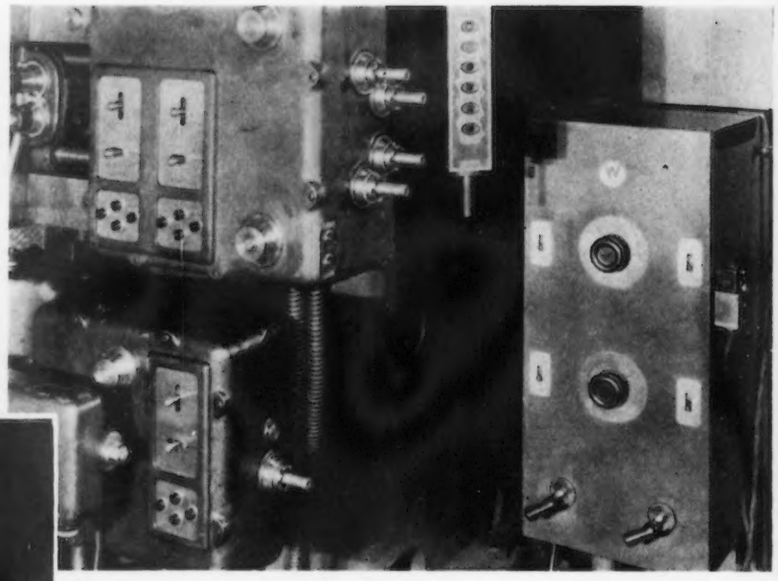
A massive housing provides rigid support for the cross-rail. It is made the same width and depth all the way to the top to provide rigidity when the cross-rail is in the higher positions, and it is tied into the bed with an unusually heavy cheek. The face of the housing on which the side head travels is 21 in. wide. The depth front to back

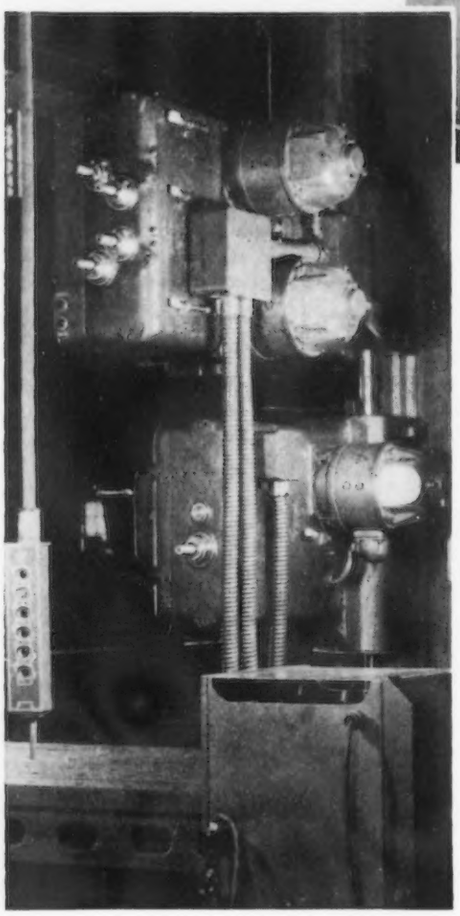
is 79 in. Because of the small amount of room required for the cross-rail mechanism, the face is well backed up with the wall of the housing and it is not necessary to neck down. Horizontal ribs 11 in. apart add to the stiffness.

The cross-rail is made in two pieces, the front face upon which the heads travel and the rear brace which supports the front face. The brace is made of welded steel to provide maximum rigidity and strength with minimum weight.

Powerful clamps operated by torque motor through a toggle mechanism hold the rail rigidly to the housing. When the clamps are released the weight of the rail and brace is taken on a hardened steel block on the outside lip of the housing face. This block has a ball seat that provides equal distribution of pressure over the entire surface.

Rail and side heads are of extremely heavy pattern and are of the same size. The tool frame holding the clapper box is a steel casting; the other parts are of semi-steel. All heads are provided with stainless steel scales and adjustable pointers. A useful feature is the hand adjustment of the rail heads, located at the head as well as at both ends of the rail. Micrometer dials are provided at the heads and at the ends of the rail.





ABOVE

THE view above shows the operator's control station and front of cross-rail on the operator's side, also the pendant push button station.

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AT LEFT

METHOD of mounting the feed and traverse motors is shown in the view of the rear of the cross-rail and side head at the left. The individual motor drives make the usual feed drive shafts unnecessary.

Tool Lifters Electrically Operated

All heads are equipped with electrically-operated tool lifters built into the slides. The lifters are operated from the limit switches for reversing the table and may be engaged or disengaged by small tumbler switches located in the rheostat panel. Reels carry the cable from the top of the housing to the railheads. The electrical tool lifters eliminate small levers, racks, pinions, etc.

An outstanding feature of the new machine is the simplification

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THE magnetic control panels are pictured at the right. The left-hand panel contains control equipment for operation of feeds, rapid traverse, cross-rail lift and cross-rail clamp.

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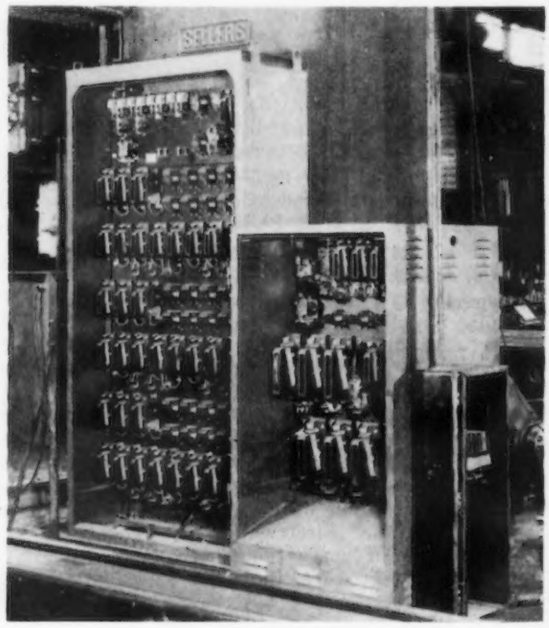


of the feed and traverse mechanism by means of electrical apparatus. A worm, worm wheel and one pair of spur gears connecting the motor to the screw and spline shaft constitute the entire mechanical part of the mechanism. Each head has its own motor, flange mounted, which provides both feed and traverse. The independent motors permit traversing any head while others are being fed. The electrical control is arranged so that while the feed is engaged for any movement the traverse can be operated in any direction without interfering with feed.

Stainless steel dials are provided for setting the amount of feed. When several heads are operated simultaneously each may carry a different amount.

The only mechanism located on top of the housing is that for lifting the cross-rail. It is contained in an oil-tight box and lubricated automatically. The lifting motor, connected to this box by a coupling, is interlocked with the torque motor for locking the cross-rail, so that only one push button is required to operate both.

Electrical Features

The machine is equipped with a total of seven motors. The main driving motor has its separate control panel of standard planer type. The other motors, tool lifters and magnetic clutches are all controlled from one panel, which is provided with the necessary interlocks and protective devices. The motor for the oil pump starts automatically when the line switch is closed, thus insuring proper lubrication to the table before it starts to move.

The following details of electrical features of the new Sellers 60-in. open-side planer are taken from data supplied by Oren G. Rutemiller, machine tool engineer, Westinghouse Electric & Mfg. Co.

The main drive motor, which is of new design, is rated at 50 to 100 hp., 150 to 1500 r.p.m. It is unique in that the 10 to 1 speed range is obtained while operating from a constant-voltage direct current supply. The speed range is obtained without the use of any auxiliary rotating apparatus. This Westinghouse wide speed range motor makes it possible to obtain very slow cutting speeds and still obtain exceptionally high return speeds. As the motor will develop 100 hp. over a range of 300 to 1500 r.p.m., it is particularly desirable when high loads are encountered by use of tungsten carbide or similar high-speed cutting tools.

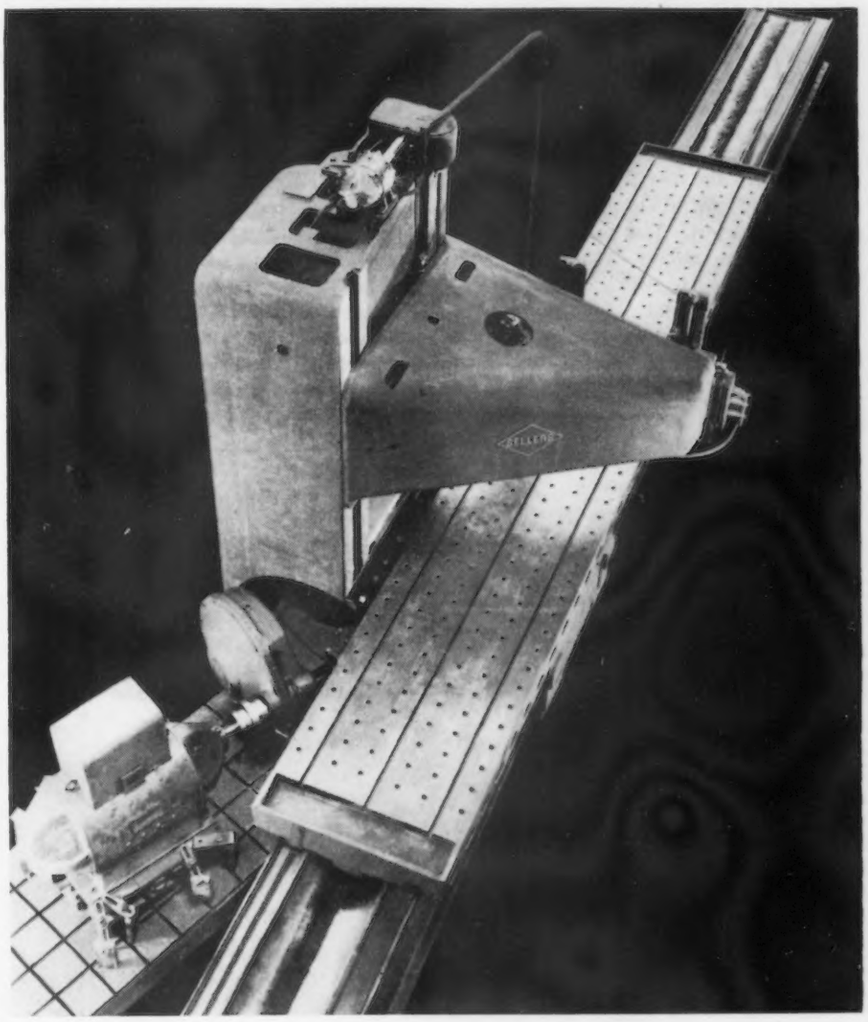
A large part of the success of this new machine may be attributed to the electrical control. The main drive control provides many outstanding features. It is of the full magnetic type and provides overload and low voltage protection. The latter not only prevents inadvertent starting on the return of power, but also gives quick and positive stopping of the platen in case of voltage failure. The system provides a self-excited dynamic braking circuit which will cause the platen to stop faster on emergency braking than on normal operation.

A line contactor is provided that always closes prior to the closing of the directional contactors. This precludes possibility of the line contactor welding since it never closes a circuit while carrying current; if the directional contactors weld the line contactor will open the circuit.

Use of the stroke limit switches for automatic control of platen reciprocation makes it possible to operate the platen at speeds in excess of 300 ft. per min.

Complete control of the normal machining operations is centralized in the pendant station. The operator does not have to manipulate any other levers or switches after the job is set up. The pendant station contains six buttons and a stop lever. From top to bottom

(CONTINUED ON PAGE 100)



BIRDSEYE view from rear showing huge steel cross-rail brace fabricated by Lukenweld, Inc. The lifting motor and mechanism are located on top of the housing. The inclosure mounted atop the main drive motor (lower left) contains magnetic contactors for the "wide-speed range" main drive motor.

Improvements in Production

Vertical Miller and Die Sinker For Mold and Metal Pattern Work

REED - PRENTICE CORPN., Worcester, Mass., have announced the new 3 VS vertical milling and die sinking machine, illustrated below. The machine is designed for rubber mold and metal pattern work and is equipped for hand longitudinal and cross feeds. Table and saddle are mounted on roller bearings carried in eccentric holders for adjustment. The hardened steel ways of the knee and saddle are doweled in position. Roller lubrication is by alemite system. The spindle is locked by a special square nut when removing collets and cutters. Table ends are slotted for clamping long plates. Longitudinal and cross feed screws are provided with adjustable nuts. Push button control with magnetic switch and plugging relay are incorporated in the spindle mechanism. Hand feeds are as follows: Longitudinal, 27 in., Cross feeds, 20 in., Vertical feed of knee, 16 in.

Ten spindle speeds, 400 to 2600 r.p.m., are available with a 1200 r.p.m. motor. The table is 32 in. long, 22 in. wide, 4 in. thick. Vertical adjustment of head on column is 5 in. Throat dept 22 in. Maximum distance spindle to table 16½ in.

Dual Method Employed In Air Filtration

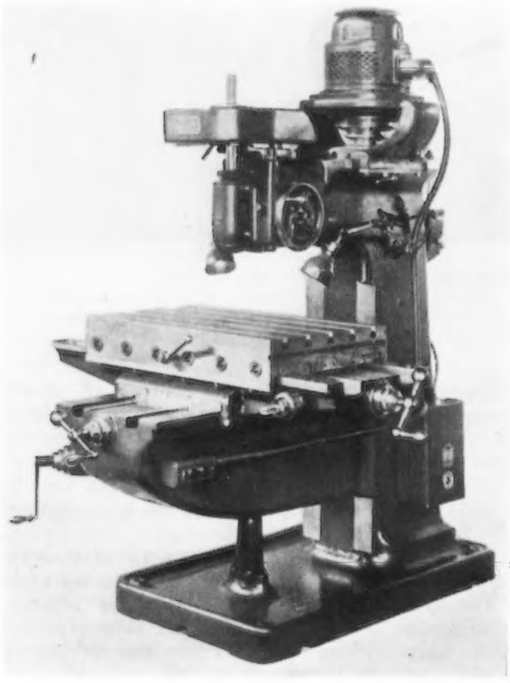
AN air filter illustrated at right combines centrifugal separation and a highly porous filter medium which retains its pore shape even though completely saturated. The device is manufactured by R. P. Adams Co., 220 Delaware Avenue, Buffalo.

Air enters through an orifice on the upper rim of the shell and circles around the inner rim at high velocity. Oil, water and other liquid content are thrown into vertical slots by this centrifugal action.

As the air velocity lessens, it approaches the center axis and passes through the walls of the porous member. This member is stone, molded into the shape of a tube closed at one end. Its lower open end is mounted on a hollow pedestal, allowing the filtered air to pass downward and out through an exit.

The tube is composed of aluminum oxide crystals mixed with a ceramic bond. It is vitrified in an oven at 1300 deg. C., with a resultant porosity of 38 per cent of its total volume. It is said that the tube so thoroughly diffuses the air passing through its porous structure, that oil or water comes into contact with the walls of the pore and is absorbed up to the saturation point.

The filter tube is easily removed and is cleaned in any oil solvent and when dried, is restored to its full absorbent utility.



AT LEFT

PUSH button control is incorporated in the spindle mechanism of this hand operated vertical milling and die sinking machine.

o o o

AT RIGHT

EQUIPMENT for use in the separation of foreign matter from compressed air, in many lines of industry, is described above.

and Shop Equipment . . .

New Rotary Production Grinder Employs Double Automatic Feeding

PICTURED below, is a special No. 72 rotary surface grinder manufactured by Hanchett Mfg. Co., Big Rapids, Mich., for use in accurately grinding the ends of cylindrical parts 1 in. O.D. by 1¼ in. long. The finished ends must be parallel to within 0.001 in. and square to within 0.0004 in. run out. The stock removal is approximately 0.040 per end. Prior to being ground, in the set-up illustrated, the pieces have been through a centerless grinder operation which has reduced the O.D. to within 0.001 of finished size. The ends have been left rough.

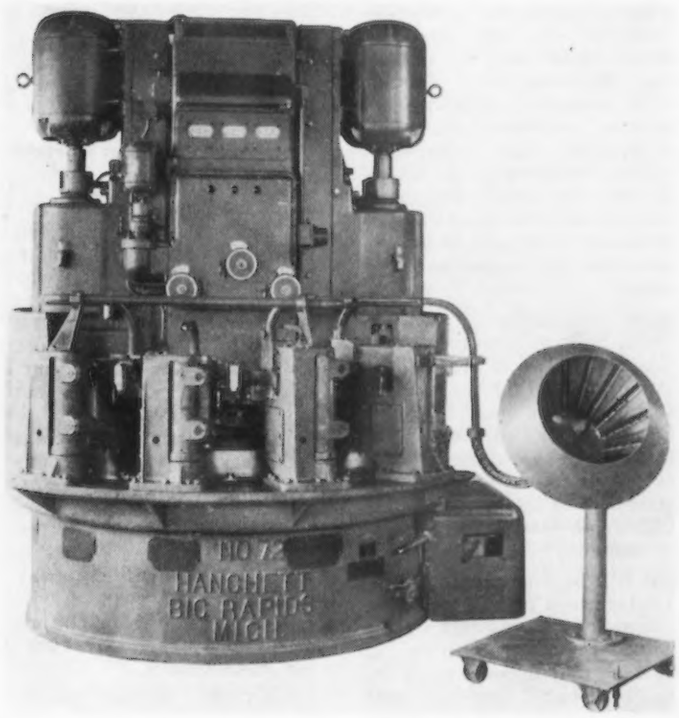
The machine bed carries a 72-in. diameter circular work table 18 in. wide. The table is driven by a variable speed unit giving a wide range of speeds from ¾ r.p.m. to 4 r.p.m.

A center column located within the center of the table supports three vertical grinding wheel heads, each carrying a 20 in. diameter cylinder wheel. Each head is driven by a 25-hp. direct connected motor. The first grinding wheel is of No. 20 grain; the second, No. 46, and the third, No. 120. This combination provides for heavy stock removal and for fine finish.

Two loading stations and two ejector stations are provided at the front of the machine; the two loading stations being at the right. In the foreground is shown an automatic loader, into which parts to be ground are shoveled. The loader mechanism feeds the parts upwardly through a loader tube and passes them through into the automatic loader station at the right, utilizing the swinging arm device at the right hand side.

The fixture which receives the parts from the automatic loader station is mounted on the finished table top and comprises 84 individual stations, each with automatic clamping means. The work is fed to each station while in motion and is carried beneath each of the three grinding wheels and thus brought to the first ejector mechanism, on the extreme left from the loading station. Here the piece is ejected upwardly and through the tube shown; passing across to the second loading station; second from the right hand side of the machine front. At this station the piece, now with one end ground, is automatically turned end for end in a clamping station and the grinding operation is duplicated on the second end. The timing releases the now completed piece at the second ejector station, second from the extreme left of the machine front, and from this point the piece is conveyed by a suitable tube into whatever container is provided.

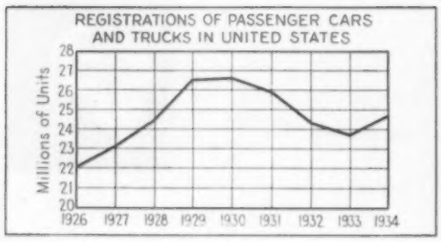
The production rate is given as 35 complete pieces per min, or 75 end surfaces per min. The entire unit weighs 33,000 lb.



Heavy Duty Buffer

HEAVY duty buffing machines of new construction are announced by the Production Equipment Co., Cleveland.

An extended spindle housing permits the mounting of heavy duty bearings close to each wheel in addition to two other bearings. The spindle is alloy steel with flanges and flat type threads. Bearings are oil lubricated. Three to 15 hp. motors for 3600 or 1800 r.p.m. are used. Push button control is provided.



THIS WEEK ON THE

Chevrolet To Make Transmissions At Muncie; Car Output at Peak

DETROIT, April 30.

IT begins to appear that when the union members at Chevrolet's Toledo plant gayly walked out a week ago, they unwittingly invited a battle which may prove to be the Waterloo for the American Federation of Labor in the automobile industry. Already the highest paid labor in Toledo and working in a plant which always has had the reputation for treating its men fairly, these unionists apparently did not have a shred of a grievance except that the management refused to sign a written contract with the Federation.

These men knew further that within two days after they quit work a duly authorized final election was to be conducted by the Automobile Labor Board and that, according to the results at the primary election already held, the A. F. of L. would have a majority on the employees' bargaining committee. They also were aware of the fact that assemblies of Chevrolet cars had been seriously delayed this year, with a considerable number of sales lost to competitive makers. Another delay, at the height of the selling season, might well prove disastrous, adversely affecting all Chevrolet employees, including those in Toledo.

So the A. F. of L., fully aware of all these facts, proceeded to call out its members at Chevrolet's transmission factory. Rather than perhaps have a repetition of the Autolite horror of last year, Chevrolet officials decided to close the plant instead of trying to operate it. The period of quiet which followed did not mean, however, that they merely were sitting back and "taking it." They were busy on plans which will make it far harder hereafter for the A. F. of L. or any other union to tie up sources of supply.

Chevrolet Orders Equipment

Within a few days after the strike started, Chevrolet had placed orders for over $300,000 worth of machine tools to be delivered with emergency speed to its Muncie Products Division at Muncie, Ind. Meanwhile it had combed Cadillac, Buick and other plants in the Detroit district for all available equipment which could be used at Muncie. As soon as a further check of machinery requirements is completed, additional equipment may be bought. Part of the work, such as the finishing of the gears, will be done by outside suppliers, according to reliable reports. Muncie Products will assemble the transmissions and make some of the parts.

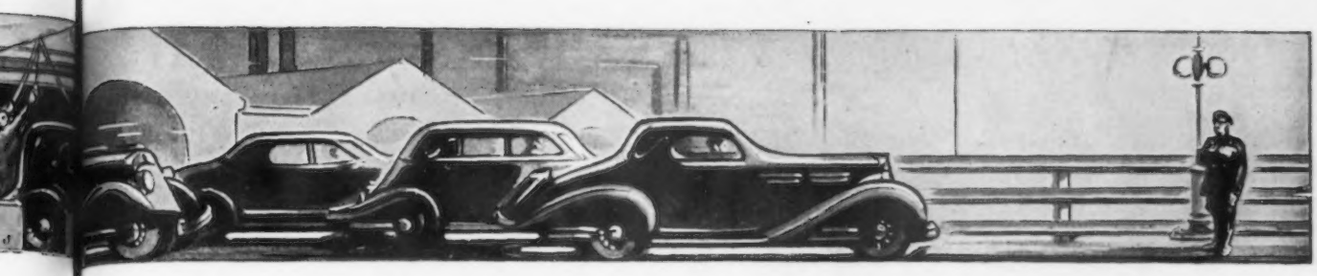
Pontiac transmissions, which have been built at Chevrolet's Toledo plant and which are said to be similar to those for the Chevrolet Master, will be made by Buick at Flint, unless present plans should suddenly be altered. This means that Pontiac transmissions hereafter will be the same as those for Oldsmobile except for a few minor changes.

What will be done about the Toledo transmission plant by Chevrolet depends almost entirely on the attitude of the workers there. If the striking employees show a desire to "play ball," Chevrolet may reopen the factory, but no longer does any division of General Motors intend to put all its production eggs in one basket. Chevrolet will be in a position to make transmissions at Toledo and Muncie and perhaps elsewhere. Fisher Body Corpn. already is understood to have spread out among its various plants in Michigan much of the work formerly done exclusively at its Cleveland factory. This policy may be questionable from the standpoint of the lowest cost per unit, but it has been developed as a matter of self-protection. It is intolerable to permit a group of troublemakers to tie up automotive production at will. General Motors seems convinced that the time is at hand to call a halt on such racketeering procedure.

Toledo People Worried

Toledo, incidentally, is rapidly acquiring the reputation of being a union hotbed which car manufacturers are desirous of avoiding. At the beginning of the Chevrolet strike, Toledo business men and civic leaders sensed the fact that the workers had done the company an injustice and feared that Chevrolet would lock up the plant and move elsewhere. Toledo newspapers diplomatically editorialized on this phase of the situation. This "black eye" which the strikers have given Toledo has filled Toledo automotive parts shops with fear that when 1936 contracts come up, car manufacturers will shy away from firms located in a city in which the source of essential parts might be dried up overnight because of labor disturbances.

Chevrolet officials leaned over backward in granting concessions



ASSEMBLY LINE

to the men at Toledo, but drew the line on unreasonable requests. Among these requests were the following: (1) that when an increase in force is necessary, the older employees in point of service shall be called back first, efficiency and practicability to be determined by the executive shop committee (of the A. F. of L.); (2) that a bulletin board shall be placed in each department for the use of this committee and the members of the union; (3) that the company shall agree to furnish the executive shop committee with a seniority list of all employees on the payroll and to notify the committee of all employees laid off and also recalled to work; (4) that the executive shop committee shall head the seniority list; (5) that the committee shall have a voice in retiming all jobs; and (6) that no foreman or assistant foreman is to have any seniority rights over productive employees. This constitutes a most amazing list of demands which Chevrolet could not afford to grant unless it were willing to surrender control of its business to its employees.

How large a supply of transmissions Chevrolet and Pontiac have on hand is a moot question. The A. F. of L. claims to have caught Chevrolet short. It is believed that stocks of transmissions are sufficient to run Chevrolet until at least May 3 and probably longer. Meanwhile, establishment of transmission manufacture at Muncie is under the personal direction of W. S. Knudsen, executive vice-president of General Motors. Everything is being done to hurry deliveries of machinery. In some cases Chevrolet is satisfied to grab standard machines which are quickly available rather than wait on special equipment. No serious hold-ups of parts or materials have yet been ordered by Chevrolet.

Motor car companies have the production accelerator pressed down flat against the floorboard. April assemblies are estimated at

BY BURNHAM FINNEY
Detroit Editor, The Iron Age

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475,000 units, and preliminary schedules place the May total at 440,000 units, although delays on the part of Chevrolet occasioned by the Toledo strike probably will cut down somewhat next month's volume. Chevrolet has indefinitely held up shipments of steel to its Flint plant but still is taking deliveries of forging steel at its local gear and axle plant. A considerable recession is looked for in June, although output that month should be around 325,000 to 350,000 cars and trucks.

Ford appears reasonably certain of having built 170,000 units in April. For May it is counting on 160,000 units, and for June 130,000. From Jan. 1 to April 30 Ford manufactured over 550,000 V-eights. General Motors intends to keep up its stiff production pace, not only through May but also through June. This month it has turned out about 170,000 units, of which 125,000 are Chevrolets. Chrysler has met with such success that it has added 25,000 cars to its contemplated output of current models, most of this extra quota to be built in May. Its assemblies this month are reported to have been more than 80,000 units. Its present rate of manufacture will be carried over through most if not all of next month.

Independent companies are exuding confidence. Hudson, fortified with $6,000,000 of new working capital, is making 500 cars a day, five days a week. Studebaker's top officials were guests of honor Friday night at a victory banquet at South Bend, Ind., in which leaders of the industry participated, celebrating the company's recent emergence from receivership. Charles W. Nash is busy not only making Lafayette and Nash cars, but also issuing belligerent statements to the effect that at least four companies are in the industry for keeps —Ford, General Motors, Chrysler and Nash.

Packard, having licked the problem of getting into volume production of a new car, is said to have on hand orders for over 12,500 of its One Twenties, of which about 4600 have been shipped. It is planning on getting its assemblies up to 5000 a day.

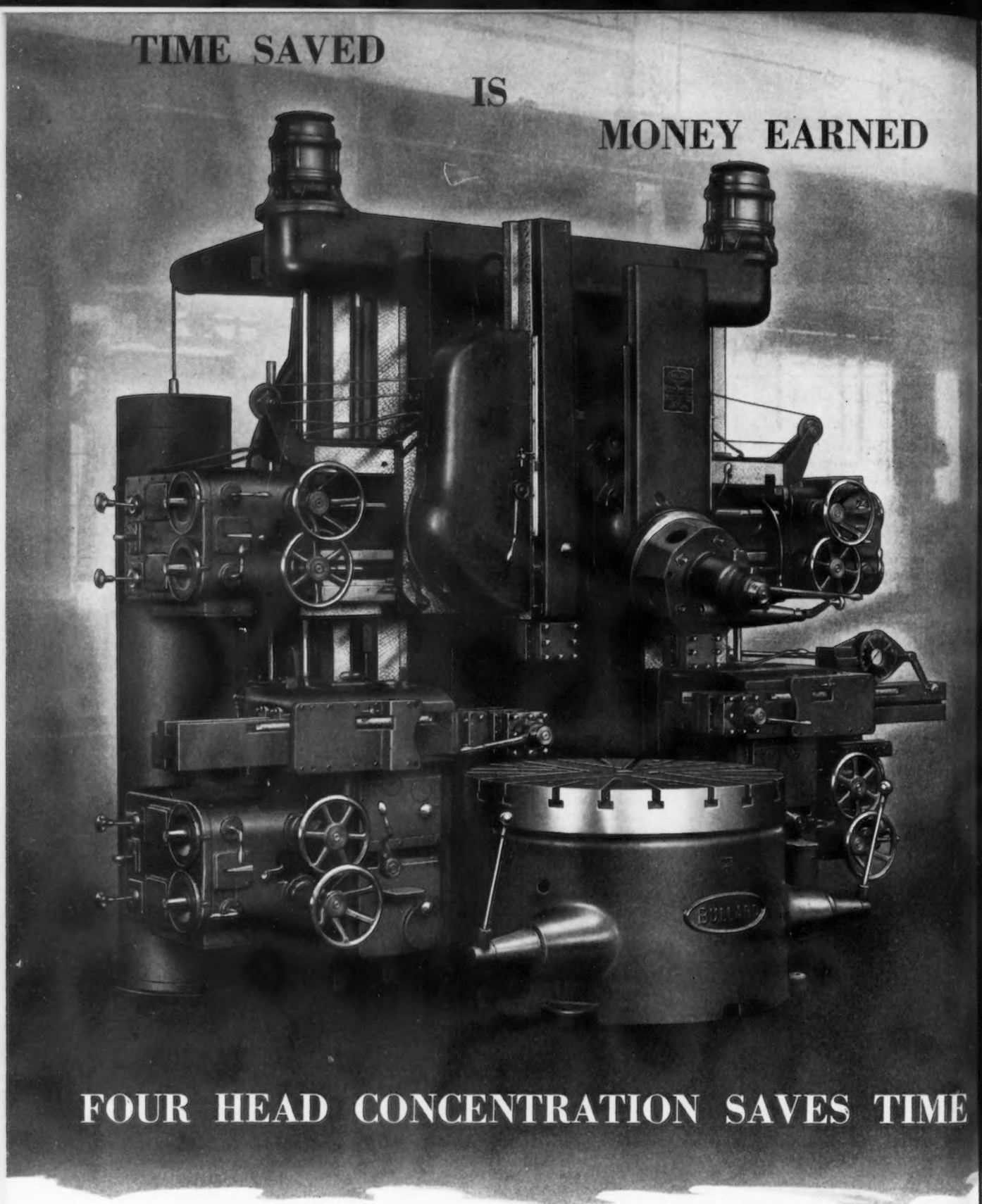
Hupmobile's two warring camps have agreed to end their row by appointment of a compromise board of directors which includes Archie M. Andrews and J. Walter Drake, factional leaders. The suit for appointment of a temporary receiver will be withdrawn. First requisite of the new management will be fresh working capital. A private loan of $250,000 to go into a revolving fund to pay parts manufacturers has been promised and a Federal loan may be procured. Vernon R. Drum is now Hupp's production manager. A. J. Brandt, who is reported to have done an excellent job of rearranging the Hupp plant for more efficient production, is understood to have resigned. The company still has on order around 3000 cars.

Expansion of automotive capacity in anticipation of bigger production in 1936 continues. Buick is said to be preparing to enlarge its facilities for the manufacture of forged parts for Oldsmobile. In this connection it may purchase some new machine tool equipment. Fisher Body's capacity at Pontiac for the building of Pontiac bodies and Pontiac and Olds stampings will be greatly enlarged, probably doubled. Whether Fisher will continue to make La Salle bodies at Pontiac is not known.

Many steel companies supplying the motor car industry shipped more tonnage from their mills in April than in March, one of the larger steel makers showing a gain of 10 per cent. Automotive steel

(CONTINUED ON PAGE 98)

TIME SAVED IS MONEY EARNED



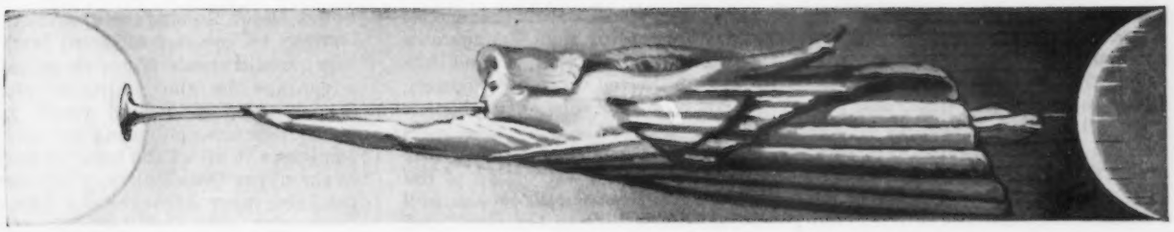
FOUR HEAD CONCENTRATION SAVES TIME

Properly distributed mass weight of Bullard Hydro-Shift Vertical Turret Lathes makes possible FOUR Head concentration of cutting without vibration.

Let Bullard Engineering Service tell you Why and How it is Profitable to buy completely Modern Equipment.

Hydro-Shift built in 46–56–66–76 and 86 inch sizes.

Bridgeport **THE BULLARD COMPANY** **Connecticut**



NEWS OF THE WEEK

British Iron and Steel Markets Still in Holiday Lull

LONDON, April 29—(*By Cable*).—Business is still affected by the holidays and anxiety over the outcome of negotiations with the Continental.

Pig iron is quiet, but deliveries are heavy. Hematite consumption is expanding.

New business in semi-finished steel is quiet, but billet makers are well booked and sheet bars are improving. Active home demand for finished steel is reported, particularly for joists, sections and channels. Shipbuilding orders are more plentiful. Exports are better, with heavy shipments of plates to Russia and rails to Canada. Scrap demand is active.

Tin plate is still under holiday influences, and exports are likely to remain restricted until other countries catch up with their quotas. A basis of agreement has been reached on home trade and a minimum price of 17s. 9d. I.C., f.o.b. works, with same extras as for export has been adopted.

Continental iron and steel demand also is affected by the holidays, and negotiations with English makers but business is fairly satisfactory, particularly in home markets.

The international tube trade is still unsettled by the dissolution of cartels, and English makers have led the way in reducing prices 20 to 25 per cent, although a further drop is unlikely and improvement is expected when outlook becomes less obscure.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 19s.
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To June 1; 18s. 5d. to 19s. 3d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4
Plate, 3/16 in. and 5 mm.	£4 2s. 6d.
Sheets, ⅛ in.	£4 7s. 6d.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

Pittsburgh Companies Oppose Ohio Canal

CERTAIN steel companies located on the three rivers in Pittsburgh and vicinity and the railroads are attempting to acquaint the public with the projected Beaver, Pa., to Struthers, Ohio, canal. An organization, known as the Upper Ohio Valley Association, was formed on April 23, at a meeting of nearly 50 railroad men and industrialists in the William Penn Hotel, Pittsburgh.

Frank J. Lanahan, president, Fort Pitt Malleable Iron Co., McKees Rocks, Pa., was elected temporary president, and a board of directors was named, consisting of: J. M. Gillespie, president, Lockhart Iron & Steel Co.; McKees Rocks; E. L. Parker, president, Columbia Steel & Shafting Co., Carnegie, Pa.; E. W. Smith, vice-president, Pennsylvania Railroad; Arthur C. Townsend, Townsend Co., New Brighton, Pa.; and Curtis M. Yohe, vice-president, Pittsburgh & Lake Erie Railroad. Carlton G. Ketchum is executive director, and McClean Work, secretary, and the association has offices at 2220 Koppers Building, Pittsburgh.

The proposed Beaver-to-Struthers canal has been included in an omnibus rivers and harbors bill, which has been passed by the House of Representatives. The same bill is now before the Senate Commerce Committee. The Upper Ohio Valley Association is asking that the Beaver-to-Struthers canal be omitted from the bill.

The following resolution was adopted by the meeting: "The

members of the Upper Ohio Valley Association earnestly oppose the construction of the proposed canal from the mouth of the Beaver River to Struthers, Ohio, and call upon all citizens interested in the welfare of Ohio, West Virginia, and western Pennsylvania to join in expressing to Congress and the Federal Administration their opposition to the project.

"Such a canal would benefit no district whatever save Youngstown and its immediate vicinity, and then only in a limited way. As proposed, it can be of no substantial benefit to anyone save the large steel companies in Youngstown. On the other hand, the construction of the canal would cause substantial and unjustified injury to the steel, coal and other heavy industries of the upper Ohio, Monongahela, and Allegheny valleys and adjacent territory; would create tremendous disadvantage to the railroads and their employees; would result in permanent unemployment and serious losses to all of the communities in the upper Ohio Valley, which depend in large measure for their prosperity upon the steel industry and the railroads."

Method of Quoting Charcoal Iron Boiler Tubes Revised

CHARCOAL iron boiler tubes, formerly quoted on a list and discount basis, are now quoted in dollars per 100 ft. The new prices in lots of 40,000 lb. or 40,000 ft. or more and in cut lengths 4 to 24 ft. inclusive are shown in the table.

The price revision is mainly one of form rather than of substance. Net prices to buyers have undergone little change.

Extras have been revised to conform with those applying to lap-weld steel pressure tubes.

KNOBBLED CHARCOAL IRON PRESSURE TUBES

Base Prices F.O.B. Pittsburgh—Dollar per 100 Ft.—Lots of 40,000 Lb. or Feet or More—Minimum Wall—Cut Lengths 4 to 24 Ft. Inclusive

Thickness—Outside Diameter in Inches — Effective April 1, 1935

Dec. In.	B. W. G. and Fraction	1¼ In.	1 5/16 In.	1⅜ In.	1 7/16 In.	1½ In.	1⅝ In.	1¾ In.	1⅞ In.	2 In.	2⅛ In.	2¼ In.	2⅜ In.	2½ In.
0.095	13	$32.00	$29.04	$26.08	$23.12	$20.16	$21.00	$21.84	$19.54	$17.23	$18.41	$19.58	....	....
0.109	12	33.00	29.93	26.86	23.79	20.72	21.84	22.96	21.27	19.58	20.75	21.92	$23.06	$24.19
0.120	11	34.00	30.82	27.64	24.46	21.28	22.68	24.08	22.61	21.14	22.71	24.27	25.37	26.46
0.134	10	38.00	34.24	30.48	26.72	22.96	24.36	25.76	24.63	23.49	25.06	26.62	27.68	28.73
0.148	9	40.00	36.16	32.32	28.48	24.64	25.76	26.88	26.36	25.84	27.80	29.75	30.75	31.75
0.156	5/32	....	....	....	....	....	....	....	....	28.63	30.27	31.91	32.57	33.26
0.165	8	....	....	....	....	....	....	....	....	31.27	32.32	33.36	34.45	35.53
0.180	7	....	....	....	....	....	....	....	....	34.54	35.72	36.90	38.20	39.50
0.188	3/16	....	....	....	....	....	....	....	....	36.44	38.07	39.69	40.89	42.09
0.203	6	....	....	....	....	....	....	....	....	39.43	41.61	43.79	45.97	48.15
0.220	5	....	....	....	....	....	....	....	....	42.83	45.89	48.95	51.70	54.44
0.238	4	....	....	....	....	....	....	....	....	45.85	49.17	52.49	55.47	58.44
0.250	¼	....	....	....	....	....	....	....	....	48.83	52.51	56.19	59.53	62.87
0.281	9/32	....	....	....	....	....	....	....	....	52.58	56.05	59.52	63.38	67.23
0.313	5/16	....	....	....	....	....	....	....	....	57.35	61.23	65.11	69.53	73.95
0.375	⅜	....	....	....	....	....	....	....	....	62.35	66.73	71.11	78.41	85.69

Thickness—Outside Diameter in Inches

Dec. In.	B. W. G. and Fraction	2⅝ In.	2¾ In.	2⅞ In.	3 In.	3⅛ In.	3¼ In.	3⅜ In.	3½ In.	3⅝ In.	3¾ In.	3⅞ In.	4 In.	4⅛ In.
0.095	13	....	....	....	....	....	....	....	....	....	....	....	....	....
0.109	12	$25.33	$26.46	$27.43	$28.39	$29.66	....	....	....	....	....	....	....	....
0.120	11	27.60	28.73	30.05	31.37	32.66	$33.95	$35.06	$36.16	$37.38	$38.60	$39.82	....	....
0.134	10	30.24	31.75	33.43	35.11	36.38	37.64	39.12	40.59	41.79	42.98	44.17	$45.36	$46.64
0.148	9	33.64	35.53	36.82	38.10	39.72	41.33	42.81	44.28	45.63	46.98	48.33	49.68	51.13
0.156	5/32	35.15	37.04	49.60	42.15	42.48	42.80	44.65	46.49	48.57	50.65	52.79	54.92	56.68
0.165	8	37.42	39.31	41.51	43.71	44.74	45.76	47.61	49.45	51.23	53.00	54.77	56.54	58.57
0.180	7	41.37	43.24	44.93	46.62	48.04	49.45	51.30	53.14	55.22	57.30	59.38	61.45	63.55
0.188	3/16	44.46	46.83	47.95	49.06	50.98	52.90	54.47	56.04	58.40	60.75	63.11	65.46	67.30
0.203	6	50.33	52.51	54.69	56.87	59.05	61.23	63.35	65.47	66.60	67.72	68.85	69.97	71.67
0.220	5	56.47	58.49	61.20	63.90	65.00	66.10	71.50	76.90	77.56	78.22	78.88	79.53	80.88
0.238	4	60.80	63.15	66.53	69.90	71.29	72.67	77.20	81.72	82.61	83.49	84.37	85.25	86.80
0.250	¼	65.30	67.73	70.43	73.12	74.59	76.05	80.30	84.55	85.43	86.30	87.17	88.04	89.90
0.281	9/32	71.09	74.94	77.47	80.00	82.17	84.34	87.41	90.47	92.25	94.02	95.80	97.57	99.15
0.313	5/16	77.63	81.31	85.20	89.08	92.32	95.55	99.11	103.66	105.46	107.26	109.06	110.85	112.57
0.375	⅜	90.84	95.99	100.45	104.90	106.97	109.04	113.41	117.78	120.13	122.47	124.81	127.15	130.02

Thickness—Outside Diameter in Inches

Dec. In.	B. W. G. and Fraction	4¼ In.	4⅜ In.	4½ In.	4⅝ In.	4¾ In.	4⅞ In.	5 In.	5⅛ In.	5¼ In.	5⅜ In.	5½ In.	5¾ In.	6 In.
0.095	13	....	....	....	....	....	....	....	....	....	....	....	....	....
0.109	12	....	....	....	....	....	....	....	....	....	....	....	....	....
0.120	11	....	....	....	....	....	....	....	....	....	....	....	....	....
0.134	10	$47.92	$49.20	$50.48	$51.91	$53.33	$54.75	....	....	....	....	....	....	....
0.148	9	52.57	54.02	55.46	57.06	58.66	60.26	$61.86	$63.46	$65.06	$66.83	$68.26	....	....
0.156	5/32	58.43	60.18	61.93	62.80	63.67	64.54	65.41	67.06	68.61	70.39	71.81	....	....
0.165	8	60.59	62.62	64.64	65.73	66.81	67.89	68.97	70.75	72.53	74.66	76.08	....	....
0.180	7	65.65	67.75	69.84	71.23	72.61	73.99	75.37	77.33	79.28	81.05	83.19	$92.83	$102.46
0.188	3/16	69.14	70.98	72.81	75.04	77.27	79.50	81.73	82.45	83.89	84.61	86.03	97.08	108.13
0.203	6	73.37	75.07	76.76	78.74	80.72	82.70	84.67	86.08	88.90	90.30	93.14	103.59	114.04
0.220	5	82.22	83.56	84.90	86.25	87.60	88.95	90.30	92.77	95.23	97.41	100.25	109.58	118.91
0.238	4	88.35	89.90	91.44	93.03	94.61	96.19	97.77	100.35	102.92	105.23	108.07	115.92	123.77
0.250	¼	91.75	93.61	95.46	97.72	99.97	102.22	104.47	108.98	113.49	112.07	122.50	127.71	132.91
0.281	9/32	100.72	103.30	105.87	107.76	109.65	111.54	113.42	117.73	122.03	121.85	130.64	136.19	141.73
0.313	5/16	114.29	116.01	117.72	119.54	121.35	123.16	124.97	128.33	131.69	131.17	138.40	144.33	150.25
0.375	⅜	132.89	135.76	138.62	141.49	144.36	147.23	150.07	156.35	162.61	162.86	175.13	180.61	186.09

THIS WEEK IN WASHINGTON

New Deal gears clash again as AAA, having squashed our cotton export trade, wants to repeat on autos.

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"Economic eunuchs" will not harm the public; some other kinds of economists have.

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American barriers to Belgian steel drop tomorrow; industry expects growing foreign penetration.

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Guffey Coal Bill fought as unwarranted invasion of private industry.

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Tin plate scrap embargo proposed as stimulus to develop domestic smelting industry.

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BY L. W. MOFFETT

Resident Washington Editor, The Iron Age

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WASHINGTON, April 30.—NRA has come out flat-footedly for "an economy, not of scarcity, but of plenty." . . . Whereupon the New Deal gears again clashed. . . . Synchronized as to time, but in sharp conflict as to economic philosophy, if any, AAA outdoes its own scheme of scarcity. . . . Administrator Chester C. Davis comes out with the quaint, if not somewhat shocking proposal, that the Government lay a partial embargo on exports of automobiles. . . . Foreign markets are taking too many American automobiles. . . . They are exhausting their exchange through this class of purchases. . . . So they must be cut down . . . and, instead, markets abroad must take more American cotton. . . . Why? . . . Because exports of automobiles last year increased 120 per cent and exports of cotton declined 20 per cent. . . .

Could anything be more logical? . . . What if the automobile industry is once more, as in 1921, an outstanding producing industry in times of depression. . . . Easily one of the the greatest, if not the greatest, single industrial element making for recovery. . . . With its high rate of employment and outstanding consumption of iron and steel, forgings, metal-working machinery, oil, grease, glass, rubber, etc., including textiles! . . . textiles that require American cotton. . . . Cut off automobile demand for American cotton that is to be fabricated into finished material, with resulting employment and purchasing power in the processes, in order that more raw cotton may be shipped abroad. . . . Penalize the automobile industry and its many supplying sources, research, engineering ingenuity, modern equipment, aggressive merchandising policy. . . . These things have brought about the remarkable expansion of the American automobile industry, both in home and foreign markets. . . . But they must smack of "rugged individualism" and therefore they are outmoded and should be junked. . . .

Which suggests that an alternative to the embargo idea might be to extend assembly lines to the ocean and dump every other new car into the briny deep. . . . It is in keeping with the idea of wholesale murder of little pigs and plowing under every third row of cotton, restricting crop acreage and other "modern" notions fitting in the scheme of planned economy—just as modern as the Pharaohs of Egypt. . . . The New Dealers won't concede that there is anything grotesque in trying to increase cotton demand from the bedeviled domestic textile industry, faced with processes taxes on the one side and rising cheaply-produced Japanese imports on the other. . . . The thing is to hold up prices, artificially if necessary, and cripple the industry though it may. . . . The opposite policy of the automobile industry and its record of achievement in increasing production and recovering foreign markets means nothing. . . .

As for more tariff protection, the President's cabinet committee, made up of Secretary of State Hull, Secretary of Commerce Roper, Secretary of Agriculture Wallace and Secretary of Labor Frances Perkins, scoffs at the very idea. . . . NRA doesn't scoff but rather insists upon the mainte-

nance of high wages—high, that is, as compared with foreign wages. . . . With which there would be general accord if the industry were given consistent treatment and provided with protection against low wages. . . .

The President, however, is said to have scored a point in his contention that one trouble with the New England textile industry is the obsolescence of plant equipment, while Japan has comparatively modern equipment, patterned after American equipment but actually improved upon. . . . Yet the cabinet committee indicates that, using this as the single yardstick, the Southern mills should be prosperous because they are more modern. . . . But the Southern mills are about as bad off as the New England mills. . . . Mr. Davis' contention is that exhaustion of exchange accounts for the decline in foreign purchases of American raw cotton. . . . Yet there has been an increase in consumption of cotton produced in other countries. . . . This makes it difficult to reconcile AAA's position with conditions prevailing in the world markets. . . . George N. Peek, vice-president, Export - Import Bank, comes nearer the mark in his statement that "competition from other foreign growths offers an ever-increasing impediment to the disposal of American cotton." . . . Mr. Peek, as President's special foreign adviser, with a background of industrial experience, has views on export expansion which conflict with those of Secretary of State Hull. . . . Mr. Peek is a "bilateralist." . . . Secretary Hull is a "multi-lateralist." . . . Mr. Peek thinks nations of the world are committed to bilateral bargaining policies which leaves Uncle Sam out in the cold unless it hoss-trades along the same line. . . . In this respect Mr. Davis is in agreement with Mr. Peek, the former declaring that "foreign countries can buy from the United States only in proportion to what they sell to this nation." . . . Secretary Hull thinks there are more than two sides involved in world trade. . . . That, say, an agreement might be reached whereby if a nation's balance is against it in one country it may be offset by a favorable balance in a third country and thus keep up its ability to increase its foreign markets. . . .

NRA, now dolled up in the robe of plenty, set forth in its vague statement on its new open price filing policy, plainly gives the impression that the bars are to be let down on restricting physical output. . . . If it does change its mind, as it so often does, the odd thing is that the policy doesn't mean anything until after Congress has disposed of the bill to extend NRA. . . . The next policy to be announced will probably relate to "loss leaders." . . . Explain it as higher-ups attempt to do, NRA is much peeved that one of its members, Dr. Leon C. Marshall, signed the Brookings report lambasting NRA. . . . The feeling was not relieved by the fact that the day after the report was published, Doctor Marshall left Washington on an automobile tour. . . . Former Administrator Hugh S. Johnson was testifying fervently in behalf of NRA's extension when the report was laid before the Senate Finance Committee by Senator King, member of the committee, and foe of NRA. . . .

Whether it was because the report cramped his style or not, Johnson was greatly peeved. . . . And, since he has turned columnist, he came out with a blast in which he called Doctor Marshall "an economic eunuch." . . . Whatever that is. . . . Paging the Sultan probably would develop no answer. . . . Meanwhile A. D. Whiteside has left the board to resume presidency of Dun & Bradstreet and Charles Edison, son of Thomas A. Edison, has taken his place to serve till July 1.

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ICC to Bring Emergency Charges Into Line

Investigation ordered last Saturday by the Interstate Commerce Commission with regard to refusal of the Ohio Public Utilities Commission to permit the new emergency railroad charges to go into effect is expected to bring into line all States holding out against the new charges. The commission has good precedent for its action in compelling the lifting of intrastate rates to the interstate level in order to prevent unjust discrimination against interstate commerce as beween carriers and shippers. The Supreme Court has upheld the commission as to its authority under Section 13 of the interstate commerce act. It was under this section that a petition was filed with the commission by railroads in Ohio asking that the Federal commission investigate to determine if the action of the Ohio commission would cause "undue or unreasonable advantages, preference or prejudice as between shippers in intrastate on one hand and undue, unreasonable or unjust discrimination against interstate commerce" on the other.

Hearing in the Ohio case was set for May 13 at the Deshler-Wallick Hotel, Columbus, Ohio, before Examiner Trezise. Similar action will undoubtedly be taken with respect to other States which have declined to permit the emergency charges to go into effect.

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Belgian Steel Exports Rise

Headway being made by Belgium in expanding export markets for iron and steel products has excited especial interest in the American iron and steel trade, in view of the fact that the American-Belgian reciprocal tariff agreement goes into effect tomorrow. It carries reduced American duties on a number of important iron and steel products and apprehension exists that this will inevitably mean penetration of Belgian steel into the United States in growing tonnages.

This belief is based partially on the fact that, despite the British duty established on iron and steel products, there was a substantial increase of Belgian iron and steel exports to the United Kingdom in 1934 as compared with 1933. The United Kingdom has for many years been Belgium's best customer for semi-finished lines.

During 1934, according to a report to the Department of Commerce from Commercial Attache T. L. Hughes, Brussels, shipments of Belgian billets and slabs to England increased from 124,988 tons to 207,000 tons. Exports of shapes increased from 93,623 tons to 102,133 tons and rolled and drawn steel exports increased from 108,181 tons to 168,433 tons. Recently Great Britain again raised duties on iron and steel products as a defense against Belgian products because of devaluation of the belga. Belgian iron and steel exports in 1934 totaled 3,477,179 tons as against 3,201,588 tons in 1933.

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Germany Junks Machinery to Get Scrap

Shortage of exchange has resulted in sharply decreasing scrap imports into Germany, according to a report from Vice Consul J. H. Wright, Cologne, but it has been possible to continue consumption at virtually the same high levels by utilizing stocks on hand and by advancing domestic stocks through increased collection activities. It is reported that substantially greater amounts of high-grade scrap have been assembled by scrapping unserviceable and antiquated machinery. The German demand for iron and steel scrap is exceptionally strong, it is pointed out, and indications are that it will continue on its present or an even higher level during the spring months. German imports of scrap

during February totaled 21,648 metric tons compared with 12,212 tons in January. The monthly average in 1934 was 40,000 tons.

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Operators Oppose Guffey Coal Bill

A committee has been appointed by the Smokeless Coal Operators in Virginia and West Virginia to oppose the Guffey bill and points out that its enactment would have far-reaching consequences in raising the price of coal to all consumers and would constitute an invasion by the Federal Government of control of private industry unprecedented even in the light of the legislation of the last two years.

"The Guffey bill," according to this committee, "goes far beyond the normal scope of Government regulation and far beyond the Government control involved in the existing codes established under NRA. Under the name of a 'code,' the Guffey bill in effect establishes in the coal industry—one not hitherto regarded as a public utility—a vast Government-controlled monopoly. It creates a monopoly because it provides for the limitation of the total coal production of the nation and the allocation of production quotas among the various districts of the industry and the various mines in each district, all under the ultimate control of a National Bituminous Coal Commission. It is monopolistic because it forbids the opening of new mines or mines not operated since 1929, except after application to the National Commission. It provides for the fixing of prices for coal by District Boards of Coal Producers under control of the National Commission. It exempts the members of the 'code' from the anti-trust laws."

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Opposes Legislation Affecting Interstate Commerce

Congress has been urged by the National Association of Manufacturers to lay aside legislation affecting the right of the Federal Government to regulate interstate commerce until the Supreme Court has passed upon the extent of the Government's jurisdiction. This would include not only extension of the NIRA, but the Wagner labor disputes bill, and the 30-hour week bill.

The statement adopted by the association's board follows:

"We commend the Administration upon its appeal to the Supreme Court in the poultry cases, seeking a prompt decision upon the authority of the Federal Government to supervise and regulate employment relations in exclusively local acts of production and service. This case will further afford an opportunity to make clear the nature and extent of the power to regulate interstate commerce. It will afford what is sadly needed, an opportunity for legislators, as well as the average citizen, to find a reliable guide in determining their duties under the law.

"A decision by our highest court will dissolve the fog of uncertainty which has hung over the country for the past two years and tended to contribute to the multiplying obstructions which have beset the pathway of recovery.

"In view of the fact that 21 Federal courts throughout the United States have emphatically declared that various assertions of the right of Federal authority to control local relations under the guise of the commerce power were all outside the authority of the Federal Government, it is important that pending legislation relating to the 30-hour week bill, Wagner labor disputes bill, and the extension of the NIRA be held in abeyance until the Court responds to the request of the Government to clearly define its powers."

Suggest Ban on Tin Plate Scrap Exports — Want Domestic Tin Industry

WASHINGTON, April 30.—Tin plate scrap exports would be prohibited and an excise tax of 6c. a lb. on imported metallic tin would be levied by a bill introduced by Chairman McReynolds of the House Committee on Foreign Affairs as a means of making the United States less dependent on foreign sources for supplies of tin and other "strategic" materials during wartime. The measure was introduced last week and accompanied a report made by a subcommittee of the House Committee on Foreign Affairs after a year's investigation looking to the fixing of a national policy with regard to supplies of strategic materials.

The McReynolds bill would authorize the President to declare an embargo on exports of tin plate scrap and levy the 6c. excise duty on recommendation of a proposed board for strategic materials, the tax being suggested as a means of establishing a domestic smelting industry. At present tin imported into the United States is smelted in Great Britain.

The bill also would appropriate a total of $725,000, of which $175,000 would be available annually for the next three years to finance prospecting for tin ore supplies in this country under Government supervision, and $200,000 for the next five years to be used for research to develop substitutes for tin. Investigation would also be extended to all materials declared by the President to be "strategic," and the supplies of which in this country were found by the board to be insufficient to meet its industrial and military needs. Listed among strategic materials in addition to tin were nickel, manganese and chromium.

Recognition was given by the subcommittee to the geographic barriers between existing sources of tin ore and the establishing of a domestic tin smelting industry but the report said these were not insurmountable.

Entirely Dependent on Foreign Tin

As a general proposition, the subcommittee held that the tin ore fields of the world must sell half of their output to the United States either in the form of ore or metallic tin, and, in emphasizing the fact that the United States is now entirely dependent on foreign sources for supplies, said:

"Whatever may be said as to the advantage to the industry of the controlled production and stabilization of price at profitable levels which have been for the time being brought about by the International Tin Committee, even a casual inspection of the structure reveals that the essential elements of permanency are lacking."

The report declared that if the United States established its own tin smelting industry, obtaining the ores from Bolivia and the Far East, its problem of keeping open the lines of supply would be no more difficult than the problem which would face Great Britain under corresponding circumstances.

"Quantitively, the problem of the United States is to procure continuing sources of supply for ap-

proximately 100,000 tons of tin ore concentrates, to be delivered annually to the United States and to establish here sufficient smelting capacity to reduce this to about 60,000 tons of metallic tin annually used in the United States," said the report.

It was pointed out that if the ore supply could be provided, capital for smelting plants would be forthcoming from private sources. To this end the subcommittee proposed that the United States Government "undertake conversations with the Governments of certain of the producing countries with a view to making plain to those countries the uneconomic and wasteful features of the present system, and the additional advantages and future security of market which would accrue to those countries by the establishment of direct and continuing shipments of their commodity to their chief consumer, *i.e.*, the United States."

Consumption of Tin

The average annual tin consumption in the United States for the three years, 1927, 1928 and 1930, as compiled by the Bureau of Mines, was 69,337 gross tons, of which 26,444 tons or 38.25 per cent was used in the production of tin and terne plate. The average annual world consumption for the period 1922-34, inclusive, was 137,404 tons. The average annual world production of tin ore during this latter period was 135,366 tons. The average output for the three leading producing sources was: Malaya, 46,649 tons; Bolivia, 30,783 tons and Netherlands East Indies, 28,334 tons.

The report pointed out that the United States produces substantially no primary tin. Among occurrences of tin in the United States superficially examined, those in the following States were said to appear to offer relatively the greatest incentive to further prospecting: South Dakota, North and South Carolina, Alabama, New Mexico and California.

The suggestion was made that three tin producing countries, Great Britain, France and Belgium, might "measurably decrease their indebtedness to the United States by payment in tin, and since such payments would not compete with any industry in the United States, their acceptance as payments on the war debts would not be attended by the objections which obtain in the case of competitive commodities.

"Certain of the tin-ore producing countries, including the three named above," said the report, "have imposed export duties on such ore leaving those countries destined to smelteries of other nationalities. Where such duties have been imposed in order to prohibit the export movement of these ores and are successfully accomplishing this result, they represent no revenue to the countries imposing them. It has been suggested that an arrangement might be possible under which the United States Government might pay these export duties on tin ore coming from these countries into the United States for smelting here and, in lieu of cash, credit an appropriate amount to the debtor nations exporting this ore. Such a plan would operate to remove one of the principal barriers to the establishment of a tin smelting industry in the United States and at the same time would permit the accrual to these debtor nations of substantial credits without any real payment, either in kind or in cash by them. It would, of course, on the one hand destroy any monopoly over the smelting of their own ores which those nations now enjoy, and on the other it would mean the employment by the United States of a portion of uncollected war debts as a subsidy to an American tin-smelting industry."

With tin in the neighborhood of 50c. a lb., the report said, as at present stabilized by the international control scheme, the average value of tin imports into the United States is approximately $70,000,000.

Substitutes Expensive

Discussing substitutes, the report said that, unfortunately, it appears that so far as the metallic substitutes for tin are concerned, those developed with any degree of success so far are cadmium, antimony and silver, all of which are either too expensive or not available in sufficient quantities.

"Some progress seems to have been made," it was stated, "in the development of organic compounds which may be employed as coatings for steel plate in the manufacture of cans and containers, but it does not appear that this progress has been sufficient to warrant any considerable degree of commercial substitution for tin in this field. On the whole it appears that no satisfactory substitute has yet been developed for the vast majority of the applications of tin either in the metallic or non-metallic form, although minor exceptions may be noted. Further, it appears that the problem has never been adequately attacked and evidence presented to the committee indicated that exploration in this field by organized research may be reasonably expected to yield important results."

The committee dismissed the suggestion to prohibit exportation of all tin-bearing materials and said by confining the prohibition to tin plate scrap less than 7 per cent of the total tin annually consumed by the United States would be affected.

"The position of the detinning plants and the producers of tinplate scrap, including the manufacture of cans and other containers from tin plate, constitute a special phase in this question," said the report. "Evidence submitted to the committee is in substantial agreement as to the necessity for a prompt and economic outlet for tin plate scrap to the producers of this material. It is also in substantial agreement on the point that the detinning companies require a certain minimum tonnage of tin plate scrap economically available in order to insure their continuing operation. Nor is there any conflict in the evidence presented which indicates that in the absence of any export market the market for tin plate scrap is restricted to that afforded by the detinning plants. There is conflicting evidence before the committee as to the degree to which the detinning companies are affected by the exportation of tin plate scrap. There is also conflicting testimony as to the practical comparative effect which the prohibition of the exportation of tin plate scrap would have upon the welfare of the can manufacturers associated with the detinning companies on the one hand and those can manufacturers not so associated on the other."

The report held, however, that if a practicable plan can be developed whereby the exportation of tin plate scrap can be restricted from time to time under competent authority and whereby ample provision can be made for the protection of those producers which might otherwise be adversely affected by such restriction, it would appear advisable.

Chevrolet Gray Iron Foundry Sets Record

THE gray iron foundry of the Chevrolet Motor Co. at Saginaw, Mich., set a new all-time record for a single day's production when it poured 2306 tons of metal on April 19. The previous record was 2152 tons attained a year ago. The new mark was made with 12 cupolas in operation. On four successive days, ending with April 19, the foundry melted an average of 2103 tons a day. The foundry makes castings for Chevrolet passenger cars and trucks, including cylinder blocks, pistons, and clutch and transmission housings.

Harrison Amendments to Recovery Act Meet Praise and Hostility in Congress

WASHINGTON, April 30.—Fearing that it would be defeated unless greatly modified, Chairman Pat Harrison of the Senate Committee on Finance did what had been anticipated when he introduced amendments which would sharply narrow the force of the National Industrial Recovery Act. The amendments would have the effect of restoring anti-trust laws largely to full force, and forbid price fixing except in the natural resources industries. Code authorities would be considerably stripped of power insofar as they indicated "the possession of Governmental power." Instead the President could "encourage the establishment and continuation of trade or industry committees composed in whole or in part of members or representatives of one or more trades or industries." The Federal Trade Commission would come into the picture more prominently than at present. It would be given power to issue "cease and desist" orders where it found "destructive, oppressive or discriminatory price cutting." It seems a foregone conclusion that the FTC would not be so inclined to make such findings as has been done so frequently by NRA itself.

The amendments would entirely remove existing authority vested in the President to approve codes with price fixing and production control provisions, where held necessary in order to protect small industries, to meet excess production emergencies or in Government-regulated industries. Much criticism has been made of such provisions in present codes and the NRA in its recently announced policy on open price filing went on record against such provision, though with some exceptions.

So-called monopolies would be barred under another amendment which would prohibit code provisions "promoting or sanctioning agreements or concerted action for the private fixing of prices or controlling of production or distribution." Exemptions, however, are proposed so that industries would continue to be permitted to agree upon a code prohibiting unfair practices, provided the agreement did not include price fixing and production control.

Codes could also include provisions found necessary by the President to "protect small enterprise against discrimination or oppression, or to deter the growth of monopolies, which may include provisions against unfair competition resulting from discriminatory or oppressive price fixing by concerted or individual action." Collection and publication of information "helpful in maintaining fair competition" would be allowed.

Amendments Written by Richberg

The amendments are reported to have been written by Chairman Donald R. Richberg of NIRB and are taken to reflect yielding by the Administration to critics, such as Senators Borah and Nye, who, with an increasing group of supporters, have stoutly held out against extension of NRA in its present form.

An alternative to what in effect is a rewriting of the recovery act to an extent that it would lose entirely its attraction for many industries has been proposed by Senator Clark of Missouri. The Missouri Senator has introduced a resolution to extend the act in its present form until next March. Supporters of the Clark resolution said the resolution would give the United States Supreme Court opportunity to pass on the constitutionality of the recovery act and thus serve notice to Congress as to what revision, if any, is necessary.

Criticism has been made that the proposed amendments offered by Senator Harrison would so greatly emasculate the recovery act that it would leave but little except Section 7-a, the collective bargaining provision; wage and hour provisions, and a few simple trade practice provisions. Even further amendments, it is said, will be proposed by critics of the act. One such amendment, urged by Senator Borah, would require the Government to state definitely that it will attempt no control over intrastate commerce.

Extension Desired

While it is reported that virtually two-thirds of the Senate stand ready to vote for extension of the recovery act, it is said that this is made provisional upon such amendments as those offered by Senator Harrison and perhaps additional ones. Many Senators freely admit in private conversation that the recovery act cannot be extended in its present form, unless it would possibly be through some such alternative as that suggested by Senator Clark. Both Senators and Representatives are under increasing fire from constituents who charge the act with all sorts of sins. One charge is that it has increased prices of food and other necessities of life to a destructive point. While the AAA rather than the NRA is largely to blame for the mounting prices of foodstuff, according to members of Congress, the fact remains that the latter comes in for a large share of the blame.

The Administration is represented as being especially desirous of continuing NRA, even if only for political purposes. For defeat of this agency, meant to be a major factor in recovery, obviously would produce a bad political reaction on the eve of a new political campaign. There are supporters of the Administration who are plainly lukewarm, if not actually hostile, to NRA but who will get back of it for the reason cited. They readily admit that NRA has not even approached accomplishments claimed for it by its ardent advocates. Some think it has been a business retardant rather than a business stimulant, even though the wage and hour provisions generally are accepted as being really sound conditions that ought to be retained.

Blue Eagle Seriously Crippled

It is clear also that NRA has lost a great amount of prestige for the simple reason that in important respects it is not working. The Blue Eagle is almost in disrepute because of the many defeats it has met in the courts, and in pending tests it promises to come out second best.

Breakdown of the recovery act in important sections of the bituminous coal industry has been pointed to as evidence of what is claimed to be a progressive weakness. Coal operators do not conceal the fact that the price structure has been entirely disregarded in quoting on some important coal contracts, one involving some 600,000 tons for a public utility in Washington. With a natural resource industry, such as coal, deprived of price stabilization, it is clear that the industry would no longer be interested in the recovery act. Wage and hour provisions, it is pointed out, cannot be adhered to if price fixing breaks down. The United Mine Workers of America shares this view as completely as does the industry and will fight to the limit for maintenance of the coal price structure, unless it turns away from the recovery act and gets behind the Guffey Government control bill. The latter has been given added support, it is believed, by the breakdown of the code price structure.

Works Relief Billions Will Linger on Way to Work

WASHINGTON, April 30.—Entering upon what President Roosevelt in his Sunday night broadcast termed "a great national crusade to destroy enforced idleness," actual allotments of the $4,880,000,000 works relief funds for desirable projects have already begun, he declared. So far the allocations have not been revealed but the first group is expected to be disclosed soon as the machinery is being perfected in Washington for disposal of this huge sum which the administration says is intended to put to work 3,500,000 employable persons now on the relief rolls. The only indications of the projects so far known are those listed in the works-relief act itself. They have been published heretofore and involve such items as highway work, grade-crossing elimination, rural electrification, etc. The iron and steel, metal-working and related industries are looking for a substantial stimulus from these allocations but the specific results in terms of requirements and reemployment necessarily have been confined only to estimates. It is the hope of the administration that these requirements will absorb employment equal to the number it is estimated will be taken off the relief rolls, or a total of 7,000,000. It remains to be seen whether or not the expectations are too optimistic as they have been in the past with regard to results from undertakings of the Federal Government on which private industry continues to depend for much of its operations.

In any event the program will not put important orders on mill books for some time. The President indicated as much when he said: "We have every reason to believe that it (the program) should be in full swing by autumn." He said he realized that the "country is expecting before this year is out to see the 'dirt fly,' as they say, in carrying on this work and I assure my fellow citizens that no energy will be spared in using these funds effectively to make a major attack upon the problem of unemployment." Just what distinction the President may have in mind between having the program in full swing and in seeing the dirt fly was not made known but certainly there is a spread between autumn and "before this year is out." It has been suggested that having the program in full swing means getting into complete motion the vast, cumbersome governmental machinery and the allocation of the funds, while seeing the "dirt fly" means actual industrial production and employment arising from allotments.

In such an event real benefits to industry from the program would have to wait until the end of the year. Meanwhile it is assumed much dependence upon industrial activity rests with private initiative. The President painted what the country will hope was an accurate picture of improvement in the way of reemployment in private work and took occasion to say that the matter of putting to work 3,500,000 persons now on relief rolls "is a problem quite as much for private industry as for the Government." Nevertheless, it is a general view that even after the funds begin to be allocated much of the money will continue to go for direct relief because of prolonged and legitimate emergency demands. Should this eventuate, it would mean that proposed outlays for industrial production and its consequent employment would be scaled below present estimates.

Fundamentals Listed

The President, assuming direct responsibility for the tremendous outlay, listed six fundamentals in directing the program:

1. The projects should be useful.
2. Projects shall be of a nature that a considerable proportion of the money will go into wages for labor.
3. Projects which promise ultimate return to the Federal Treasury of a considerable proportion of the costs will be sought.
4. Funds allotted for each project should be actually and promptly spent and not held over until later years.
5. In all cases projects must be of a character to give employment to those on the relief rolls.
6. Projects will be allocated to localities or relief areas in relation to the number of workers on relief rolls in those areas.

Allocating funds in proportion to unemployment would apparently mean that the major portion of the money would go to the great industrial centers, including those with large capital goods capacity. Yet setting up yardsticks so that a considerable proportion would go into wages and turning to projects that would mean returns to the Federal Treasury, highly desirable as they are, are held to be difficult as a measurement in face of emergency needs. There also is the inevitable political element whereby tremendous pressure already is being brought to get funds for pet projects of localities throughout the country in the hope of political gains from the campaign which sets in about the time the projects are expected to be well under way. The President took note of the political implications of the set-up when he said "No sectional, no political distinctions can be permitted." Nevertheless, there is widespread feeling that it would be little short of miraculous if it were found possible to carry out this Presidential dictum.

The vastness and complexity of the Government machinery to direct the program is evident from the organization which the President has set up. Inevitable though it was, the question has risen as to whether or not it is so extensive that it will be beset with so many imponderable and slow processes as to make it extremely difficult of operation. It is, of course, inescapable that there will be much governmental red-tape involved in the highly socialized machinery for putting it into motion, for it is to have strict governmental control and direction.

The Administrative Set-Up

First comes a division of application and information. It is headed by Frank C. Walker, made chairman of the National Emergency Council, supplanting Donald R. Richberg, permanently transferred to the chairmanship of the National Industrial Recovery Board. Mr. Walker, New York attorney, has been previously called upon by the administration to serve on emergency programs. His organization will be a clearing house to pass upon applications and to determine which projects shall be given study, and sent to the allotment division, headed by Harold L. Ickes, PWA administrator. This division consists of 23 members. This division will decide as to whether it thinks money should be allotted to the projects before it. Its recommendations will then go to the President who will either approve, reject or modify the projects. The Ickes' division comprises representatives of the more important governmental agencies and of cities, of labor, farming, banking and industry.

Next comes the progress division, headed by Harry L. Hopkins, FERA administrator. This division, as the President pointed out, will have the duty of coordinating the purchase of materials and supplies and of "making certain that

people who are employed will be taken from the relief rolls." It will also, he said, have the responsibility of determining work payments in various localities, of making full use of existing employment services and to assist people engaged in work relief to move as rapidly as possible back into private employment when such employment is available. Moreover, he said, this division will be charged with keeping projects moving on schedule.

In order, he said, to avoid, "so far as possible, the creation of new governmental machinery for supervising this work," the President said that the some 60 different Government agencies will carry on the 250 or 300 kinds of work that will be undertaken. These agencies, he explained, therefore will simply be doing on a somewhat enlarged scale, the same sort of things that they have been doing.

Briefly, work of planning will be under the direction of Mr. Walker, financing by the Ickes board and supervising by the Hopkins division. Mr. Hopkins, as purchasing agent, will have as his chief assistant, Admiral Christian J. Peoples, head of the Treasury Department Procurement Division. Dr. Rexford G. Tugwell, Undersecretary of Agriculture, will head a division of rural settlement, which is expected to propose expenditure of large sums on a soil-erosion program, estimated to mean an outlay of $350,000,000.

The Civilian Conservation Corps is to be expanded threefold to a membership of 600,000 under Robert Fechner. Outlays for it will go for highway construction, widening and improvements, and for elimination of grade crossings, water conservation, reclamation, irrigation, rural electrification, and lost-cost house building.

Seek Exemptions from Code Provisions

WASHINGTON, April 30.—The Sheffield Steel Corpn., Kansas City, is seeking exemption from the labor provisions of the fabricated metals code and permission to operate under the labor provisions of the iron and steel industry code.

The Measuregraph Co., St. Louis, is asking exemption from the maximum hours provisions of the screw machine products manufacturing industry code, subdivision of the fabricated metal products code, and permission to work skilled mechanics 45 hr. a week for a period of 10 weeks without overtime payment.

H. A. Sarvis, receiver of Hugh Lyons & Co., Lansing, Mich., has applied for exemptions from the maximum hours provision of the fabricated metal products code and permission to work its employees in excess of 40 hr. a week without payment of overtime.

Electrical Manufacturing: The N.I.R.B. has approved an amendment to the code for the electrical manufacturing industry prohibiting industry members from selling below current net price lists. The amendment is effective May 10.

CODES

Steel Plate Fabricating: The code authority for the steel plate fabricating industry has applied for approval of its proposed $59,050 budget, and the basis of contribution, for the period from May 1, 1935, to April 30, 1936. The basis of contribution would be 0.2 per cent of the total monthly billings of fabricated materials coming within the jurisdiction of the code for the industry.

Rolling Steel Door: The code authority of the rolling steel door industry has applied for approval of a proposed $4,450 budget, and the basis of contribution, for the period Jan. 1 to Dec. 31, 1935. The basis of contribution would be 0.5 per cent of the gross invoiced value of the industry products, including erection of doors, shipped during the preceding month, the assessments to be paid monthly.

Wheel and Rim Manufacturing: The NIRB has approved an amendment to the code for the wheel and rim manufacturing industry, a product group of the automotive parts and equipment manufacturing industry, exempting export sales from provisions of the supplementary code with regard to prices, discounts, deductions, allowances, extras or methods and/or terms of sale.

Hack Saw Blade: The code authority for the hack saw blade manufacturing industry has applied for approval of a proposed code amendment which would prohibit industry members from selling on terms more favorable than those set forth in their published price sheets at the time outstanding, and in force under the conditions applicable to such sales.

Code Authorities Approved

The NRA has announced recognition of the following members of code authorities:

Farm Equipment Industry: W. King White, Cleveland Tractor Co., Cleveland; W. C. MacFarlane, Minneapolis-Moline Power Implement Co., Minneapolis; C. R. Messinger, Oliver Farm Equipment Co., Chicago; H. C. Merritt, Tractor Division, Allis-Chalmers Mfg. Co., Milwaukee; Charles T. Ray, B. F. Avery & Sons Co., Louisville, Ky.; H. L. Dempster, Dempster Mill Mfg. Co., Beatrice, Neb.; W. L. Clark, J. I. Case Co., Racine, Wis.; William H. Roberts, Jr., S. L. Allen & Co., Philadelphia; M. F. Holahan, International Harvester Co., Chicago; Frank Silloway, Deere & Co., Moline, Ill.; N. C. Heacock, Caterpillar Tractor Co., Peoria, Ill.; W. D. James, James Mfg. Co., Fort Atkinson, Wis.; H. C. Angster, Chicago Well Supply Co., Chicago; and W. A. Zaloudek, Oakes Mfg. Co., Tipton, Ind.

Railway Car Building Industry: W. M. Ryan, Ryan Car Co., Chicago, to succeed the late F. E. Symons.

Die Casting Manufacturing Industry: F. P. Assmann, Precision Casting Co., Inc., Syracuse, N. Y.; H. H. Doehler Die Casting Co., Toledo, Ohio; G. M. Rollason, Aluminum Co. of America, Garwood, N. J.; H. H. Wiss, Superior Die Casting Co., Cleveland; and S. A. Hellings, Stewart Die Casting Corpn., Chicago.

Special Tool, Die and Machine Shop Industry: H. A. Stoddard, Interstate Mechanical Laboratories, Inc., New York; Miles Irmis, Superior Tool & Stamping Co., Chicago; and C. R. Quine, Akron Equipment Co., Akron, Ohio.

Coal Cutting Machine Industry: J. A. Noyes, Sullivan Machinery Co., Chicago; R. L. Cox, Jeffrey Mfg. Co., Columbus, Ohio; William E. Goodman, Wm. E. Goodman Mfg. Co., Chicago.

Coal Mine Loading Machine Industry: W. E. Barrow, Joy Mfg. Co., Franklin, Pa.; R. L. Cox, Jeffrey Mfg. Co., Columbus, Ohio; William Whaley, Myers-Whaley Co., Knoxville, Tenn.; J. A. Noyes, Sullivan Machinery Co., Chicago; and William E. Goodman, Goodman Mfg. Co., Chicago.

Multiple V-Belt Drive Industry: Walter Geist, Allis-Chalmers Mfg. Co., Milwaukee; J. M. Degnan, Worthington Pump & Machinery Corpn., Harrison, N. J.; Walter Siegerist, Medart Co., St. Louis; E. M. Carver, Dodge Mfg. Co., Mishawaka, Ind.; W. F. Coleman, W. A. Jones Foundry & Machine Co., Chicago; and G. O. Rockwood, Rockwood Mfg. Co., Indianapolis.

Safety Metal Tread Manufacturing Industry: Charles E. Loehr, Wooster Products, Inc., Wooster, Ohio; E. W. Wyman, American Mason Safety Tread Co., Lowell, Mass.; W. H. Rogers, Safe Tread Co., New York; William H. Sayre, American Abrasive Metals Co., New York; Samuel Broido, Wooster Products, Inc., Wooster, Ohio; and Samuel Lamson, Universal Safety Tread Co., Lowell, Mass.

Electro Plating and Metal Polishing and Metal Finishing Industry: Committee for District No. VI—A. R. Tonon, Rust Proofing Co., Cambridge, Mass.; A. N. Garrepy, A. N. Garrepy, Worcester, Mass.; Thomas J. Murray, T. J. Murray Co., Springfield, Mass.; F. F. Sahen, National Sherardizing Co., Hartford, Conn.; and H. B. Wilson, Plainville Electric Plating Co., Plainville, Conn.

Ames Case Dismissed By Supreme Court

WASHINGTON, April 30.—The Supreme Court of the United States yesterday dismissed the case of W. Ames & Co., Jersey City, N. J., steelmakers, who had attacked the validity of the NRA and the steel code, claiming they were unconstitutional because they attempted to regulate hours and wages.

New Deal Under Scrutiny At U. S. C. of C. Meeting

WASHINGTON, April 30.—Beginning its four-day twenty-third annual meeting here yesterday, the Chamber of Commerce of the United States in choosing "American Business Policies" as its general subject presented papers today which were extremely critical of the New Deal. Indications are that this note will be sounded throughout the session. Governmental bureaucracy, increasing Federal control over and interference with business, socialistic experimentation, and pending legislation, such as the Wagner labor disputes bill, banking and holding company legislation and other proposals now before Congress, as well as laws already enacted, came in for sharp attack.

In opening the general session today, President Henry I. Harriman said that as he discusses with business men the measures comprising the New Deal he is impressed with the fact that the chief objection is not to the basic principles underlying many of these measures, but to the extremes to which they are carried. He declared that the New Deal has attempted much that is good, but has tried to do too much in too short a time. There is little opposition, he said, to reasonable regulation of the sale of securities or to the regulation of stock exchanges. But, he pointed out, there was justly great opposition to the extreme form in which these measures were introduced. Basic principles of NRA were declared to be sound in the opinion of most business men but they are bitterly opposed to an attempt to bring the entire nation under the Blue Eagle and to invoke the commerce clause for the regulation of beauty parlors and barber shops. Business, Mr. Harriman said, favors cooperative action among farmers to reduce surpluses and maintain fair prices, but it has no sympathy with recent drastic amendments which might be used to regiment both the farmer and the producer of farm products.

Huge Dammed-Up Demand

Mr. Harriman referred to the tremendous potential demand for new capital goods, stating that careful statistics, based upon income tax returns of corporations, indicate that by July 1, 1935, deferred depreciation will amount to more than $20,000,000,000. Included in this was the national equipment structure in machinery for production, transportation and distribution. Also, he pointed out, the Interstate Commerce Commission has estimated that if railroad traffic were back at the average level of 1927-31, the deferred maintenance would amount to over $600,000,000. This, it was stated, does not include other expenditures for new and improved light-weight trains nor desirable expenditures, estimated at $200,000,000 a year, for the elimination of grade crossings. Again, he said, there are over 25,000,000 motor vehicles, wearing out at the rate of 5,000,000 a year. Estimating the cost of these replacements at $600 per car, he said, there is another $3,000,000,000.

Mention was made by Mr. Harriman of what he said was real business recovery that has taken place both in the United States and abroad. It was stated that already industrial production in the United States as measured by the Federal Reserve's index is within 90 per cent, and as measured by the index of Colonel Ayres is within 80 per cent of normal. Forty-two million people were said to be at work, while 18,000,000 are out of work, and the problem that it was said faces the country is such a restoration of business confidence that the index number of business activity may rise to par, and the unemployed may be set to work.

Mr. Harriman said that in his judgment this can be speedily accomplished by:

First, an assurance that Congress will adjourn soon and that thereafter major reform measures will await a real revival of industry.

Second, an international stabilization of currencies at the earliest possible date, so that foreign trade may move with less hazard.

Third, a strong assurance that further devaluation of the dollar will not be used as a measure to restore prices and,

Fourth, assurance of a definite and drastic reduction of Government expenditures after the present emergency appropriations have been spent.

"If business can have these four assurances, it will soon revive; the capital goods market will open up; unemployment will be greatly reduced; Government relief expenditures will be vastly lowered; the income of the Government will rise, and the budget will balance," said Mr. Harriman.

He declared it has been the genius of the Anglo-Saxon race to steer clear of extremes, and to "muddle through," or more accurately, to "middle through." This middle course, "this mean between radicalism and conservatism," it was stated, bears the earmarks of intelligent hardheadedness. It recognizes, said Mr. Harriman, the desirability of the ideal, without relinquishing its grip on the practical. The world today was said to be suffering from an excess of headlong idealism, which in the minds of many, connotes a different order of society rather than the improvement of the civilization "which has carried us so far and so well throughout the centuries."

Amend the Fletcher-Rayburn Bill

He attacked the holding company bill as now drafted and urged four amendments in order to encourage investment. He said a provision in the bill for dissolution at any fixed time, whether five years or 10 years hence, will act as a pall on the industry, will prevent financing of needed extensions, will materially handicap the revival of capital goods industries so much needed and will depress the values of holding companies' securities far below their real worth.

The importance of revival of the capital goods industries was emphasized at a discussion at the Civic Development and Construction Table, dealing with durable goods and housing.

John W. O'Leary, president, Machinery and Allied Products Institute, said that never before in his experience has either volume or possibilities been so great and never before has there been a time when "we should strive harder to capitalize our opportunities."

By far the greatest unemployment exists in the capital goods industries, Mr. O'Leary said. In 1934, he stated, there were 1,500,000 unemployed in the consumer industries, or unemployment of 9 per cent. This was compared with 5,000,000 unemployed in capital goods, or 50 per cent unemployed. Service trades in 1934 were said to have had 4,000,000 unemployed, or 18 per cent.

"It is important to remember," said Mr. O'Leary, "that in normal times annual purchases in the United States of consumer goods totaled about $30,000,000,000, while capital goods output was more than $40,000,000,000, and that since 1929 consumer goods have never declined more than 35 per cent from normal and are within 10 per cent of normal, while capital goods have dropped in volume 75 to 80 per cent."

During the 10 years ending with 1930, said Mr. O'Leary, the volume of savings flowing into investment in new securities, exclusive of refundings of every kind, averaged about $3,500,000,000 per annum. In 1931, because of the liquidation then in progress, it was pointed out, this had dropped 53 per cent to something less than $1,600,000,000. By 1933, due to various restrictive measures and uncertainties, it was stated, the figure was only $125,000,000, or about 3½ per cent of the 1920-'30 average. For the 12 months ended Sept. 30, 1934, this was said to have increased to $137,000,000, which is but 3.9 per cent of the 1920-'30 average.

Figures of the National Industrial Conference Board based upon 1929 production value of manufactured goods of $61,300,000,000, it was stated, show that there has been an unrealized output during the five depression years of 1930 to 1934 of 133.1 billion dollars. All production of goods including agriculture and non-manufactured goods in 1929 was placed at something more than 70 billions of dollars. Reasonably assuming that approximately the same ratio would apply to the enlargement of the figure, the unrealized output of industry for each of the five years, it was said, could have been 43.3 per cent, or $30,380,000,000 per year, or an aggregate of $151,900,000,000. It was pointed out that this does not necessarily mean that this amount of unrealized output, or the greatest portion of it, is accumulated into an effective present day demand, or even if not a present demand that it may in large part become a future realization. But it is known, said Mr. O'Leary, from these figures that a staggering sum of unrealized output is recorded, evidencing the fact that repression of requirements has been most severe, "and we do know that millions of our citizens are in need and if not in actual want are eager, potential purchasers for immeasurable commodities, services and improvements."

Equipment Potentialities

Various surveys were cited to show actual present equipment needs of American industry, including the one recently completed by MAPI, which showed potential requirements for machinery alone of $18,500,000,000. Equipment purchases during 1933 of rolling stock by Class I railroads were said to have been 94.4 per cent less than the 12-year average, 1922 to 1933, inclusive. An upturn in business for the railroads, said Mr. O'Leary, would make possible normal additional purchases of $250,000,000 annually. Potentialities for modernization were declared to be enormous. It was pointed out that the Interstate Commerce Commission reports that as of Dec. 31, 1934, 61.3 per cent of all locomotives were more than 20 years old. The rate of advancement in locomotive construction was said to be such that it is fair to regard all equipment more than 10 years of age as obsolete, in which case all motive power numerically would be 91.7 per cent obsolete. Were the 46,401 locomotives replaced by 40,000 units of modern design and economy, it was stated, expenditures of $2,750,000,000 would be involved at present prices. Additional track, signal equipment, shops and housing, heavier rail, electrification, Dieselization, air conditioning, equipment replacement, elimination of grade crossings, and other improvements, Mr. O'Leary said, normally required or necessary for improved service and decreased running time, present a potential demand of tremendous proportions. The American Iron and Steel Institute, he stated, reported recently a backlog of steel requirements of 67,000,000 tons, representing 17 months' production. Equipment needs to properly handle this tonnage, it was pointed out, are already reflected by an announced modernization program of $125,000,000.

"While we see about us these real and tangible needs," said Mr. O'Leary, "the fact remains that American industry is only slowly responding to the purchase of equipment. The capital goods industries remain depressed, and deferred programs, postponed purchases and a spirit of caution and watchful waiting beset us."

Reasons for this situation were listed under three heads, price, purchasing power or credit facilities and absence of business confidence. In connection with comment on price, Mr. O'Leary said the replacement of obsolete facilities and the opening of new ventures will be undertaken only in anticipation of profit and it is essential that equipment be procurable at prices sufficiently low to make probable a profit in their future.

"We have embarked under the National Recovery Administration upon a trial of a new economic philosophy which has had a profound effect upon prices through its effect upon all labor costs, direct and indirect, involving every phase of development of materials, manufactures and distribution." It was said the accomplishment of recovery through an economy of plenty instead of an economy of scarcity would appear to require such flexibility of hours as to facilitate production through a unit labor cost which without denial to the workman of a living wage will result in a price for the product that will make it available.

Speaking of purchasing power and credit facilities, Mr. O'Leary said a real need for intermediate credit up to seven years is felt and is obtainable through the RFC under rather severe restrictions. There has been, he said, widespread disinclination on the part of manufacturers to avail themselves of this medium of credit. A decided preference for privately financed credit, it was said, is reflected in the greater interest in the operations of the FHA, but these facilities if extended for industrial plant rehabilitation and replacement would be limited to maximum loans of $50,000. As to long term and intermediate credit, said Mr. O'Leary, it is the belief of most business men that such credit could and would be promptly made available if regulatory measures which preclude the establishment of private facilities to handle business of this character were properly modified.

Ships Will Call For 46,000 Tons of Steel

WASHINGTON, April 30.—It is likely that it will be late summer or early fall before steel requirements for the 24 ships in the new Naval program reach mill books. Total steel requirements are estimated at 46,100 tons, of which 27,660 tons is plates, 13,830 tons is shapes and 4610 tons is bars. The new ships authorized in the appropriation bill, for which $88,310,000 is provided, are two cruisers, one aircraft carrier, 15 destroyers and six submarines.

The cruiser steel requirements are estimated at 14,000 tons, consisting of 8400 tons of plates, 4200 tons of shapes and 1400 tons of bars. The aircraft carrier will require about 15,000 tons, consisting of 9000 tons of plates, 4500 tons of shapes and 1500 tons of bars. The destroyers will require about 13,500 tons, consisting of 8100 tons of plates, 4050 tons of shapes and 1350 tons of bars. The submarines will require about 3600 tons, consisting of 2160 tons of plates, 1080 tons of shapes and 360 tons of bars.

The bill has been passed by the House and is now before the Senate Committee on Naval Affairs.

Another Excursion To Wonderland

COMMENTING upon the latest administrative proposal for an "excursion to economic wonderland," Alfred P. Sloan, Jr., president, General Motors Corpn., has issued the following statement:

"My attention has been called to the suggestion made by Chester C. Davis, Agricultural Adjustment Administrator, as reported in the morning press of April 25. Mr. Davis finds fault with the growing increase of motor car exports and the growing decrease in cotton exports. True to the thinking of the moment, he proposes to correct the difficulty by more regulation—the universal cure-all. I would suggest that he look into the fundamentals and find out what is really happening. Why are the world markets absorbing an increasing number of American motor cars, and why are they absorbing a decreasing amount of American cotton? It is simply because thy can buy greater value of motor cars in the world markets from America than from anywhere else. Now as to cotton. The circumstances are directly opposite. Other producers of cotton are glad to sell at lower prices, hence they get the business. The number of dollars available in foreign exchange is, to be true, a factor. But far more fundamental is the question as to whether the deal is possible irrespective of foreign exchange. It certainly is not, because it is not profitable to the buyer. The whole situation is very plain.

"But let us look into the matter further. Why is it that 40 to 50 per cent of our cotton was formerly sold abroad and why are conditions now so different? It is a practical illustration of the fallacy of the "theory of scarcity," which has hypnotized our economic thinking. That thinking prejudices our whole national economy. Normal recovery is retarded. The automotive industry suffers relatively, but because of its recognized high efficiency and large volume possibilities as compared with competing manufacturers in other producing countries, it is still able to exist and to sell its products abroad, but the unfortunate producer of cotton for export has not the same fundamental advantage. I sympathize with him. I sincerely hope that something will be done. But if it is not, his suffering will be short lived because he can not continue to exist in the face of such a policy.

"What is suggested is nothing more or less than to regulate out of the world markets American motor cars that represent American labor, American material, even a certain amount of American cotton itself, and try to substitute more cotton that we cannot sell at the price we must ask.

"I make these observations in the hope of discouraging what will turn out to be another excursion into economic wonderland, and in behalf of the automotive industry as well as of national recovery in both of which I am profoundly interested."

Welding Society Elects J. J. Crowe President

ELECTION of officers of the American Welding Society at its sixteenth annual meeting, held at the Hotel Pennsylvania, New York, April 25, resulted in naming of J. J. Crowe, engineer in charge of apparatus research and development, Air Reduction Sales Co., Jersey City, N. J., as president, and E. R. Fish, Hartford Steam Boiler & Inspection Co., Hartford, Conn., as senior vice-president. C. A. McCune, secretary, Magnaflux Corpn., New York, and Miss M. M. Kelly continue as treasurer and secretary respectively. W. Spraragen is technical secretary.

J. J. CROWE

New divisional vice-presidents are: Turner C. Smith, General Petroleum Corpn. of California, Los Angeles, Pacific Coast Division; and E. E. Dillman, Wyatt Metal & Boiler Works, Dallas, Tex., Southern Division.

Five new directors were also elected. They are: Dr. C. A. Adams, Harvard Engineering School, Cambridge, Mass.; H. M. Hobart, General Electric Co., Schenectady; F. T. Llewellyn, United States Steel Corpn., New York; G. D. Spackman, Lukenweld, Inc., Coatesville, Pa., and H. L. R. Whitney, M. W. Kellogg Co., New York.

Increase in the society's membership by more than 230 and the formation of additional sections at Baltimore, Milwaukee, Toledo, Salt Lake City and Denver, which when consummated will make a total of 17 sections, were reported at the business session.

Society Takes Over Welding Bureau

It was proposed and affirmatively voted that the society assume sole sponsorship of the activities of the American Bureau of Welding, the joint research committee of the A.W.S. and the National Research Council. One reason is that most of the agencies now cooperating in the work of the A.B.W. are inactive. The transfer will include the structural steel and the fundamental research committees.

Investigation of welds subject to bending is being continued by the structural steel welding committee, which is headed by L. S. Moisseiff, consulting engineer, New York. The investigation of seat angles and beam connections, using both covered and bare welding wire, is also active, and the research program under the direction of Prof. Inge Lyse, at Lehigh University, has been extended for another two years.

Welding codes have been adopted in whole or in part by some 140 municipalities, and in establishing such codes committees of the A.W.S. have actively cooperated. Welding data have recently been supplied to the Philadelphia city planning commission and to the city of New Britain, Conn.

A preliminary code is being prepared by the society's committee on rules for welded construction of storage tanks. A committee on design of welded penstocks, with Dr. W. F. Durand as chairman, has been formed.

Publication of a welding manual or handbook by the society is contemplated, and the New York section is planning an extension course for welding operators.

The meeting was devoted for the most part to the annual business session and the reports of committee and section chairmen. Dr. D. S. Jacobus, advisory engineer, Babcock & Wilcox Co., and retiring president, presided.

Steel Corporation Shipments Rise 657,000 Tons; 50c. Dividend Paid

EARNINGS and income of the United States Steel Corpn. and subsidiary companies for the quarter ended March 31, 1935, after deducting ordinary repair and maintenance expenses and taxes, amounted to $12,428,449. This figure compares with earnings of $3,761,716 for the final quarter of 1934 and $6,578,731 for the first quarter of 1934. As in the previous quarters, the board of directors voted a ½ per cent or 50c. dividend on preferred stock for the initial 1935 period. This dividend is payable on May 29 to stockholders of record on May 3, 1935.

Shipments of finished steel products for the first quarter of 1935 totaled 1,785,248 tons, as compared with shipments of 1,128,711 tons in the preceding quarter and 1,305,000 tons in the first quarter of 1934.

After allowances for depletion, depreciation and obsolescence (amounting to $11,395,180 for the first quarter of 1935) and interest on bonds and mortgages, overhead expenses and taxes on Lake Superior ore properties and transportation services, the net result for the initial 1935 quarter is a deficit of $2,173,801. The 50c. preferred stock dividend represents an additional payment of $1,801,405; consequently the total deficit for the quarter provided from undivided surplus amounts to $3,975,206, as compared with a total deficit of $12,035,818 for the preceding quarter and $8,791,370 for the first quarter of 1934.

Bethlehem Had Small Deficit

The Bethlehem Steel Corpn. sustained a deficit of $607,298 in the first quarter, after all charges including provision for depletion and depreciation. In the first quarter of last year, a deficit of $902,044 was reported, while a profit of $411,099 was earned in the fourth quarter of last year.

Unfilled orders on hand March 31 amounted to $57,202,828, compared with $56,817,681 at the end of the preceding quarter and with $76,345,878 on March 31, 1934. Steel production averaged 39.1 per cent of capacity in the March quarter, compared with 26.2 per cent in the December period and with 38.7 per cent in the March quarter last year. Current production, according to E. G. Grace, president of the corporation, is at approximately 40 per cent.

In discussing business conditions, Mr. Grace said he believed production would hold around the current level throughout this quarter. He voiced the opinion that there would likely be no important change in steel prices while production remained below normal. He admitted that automobile buying would probably slacken in May or June, but that this loss would be compensated for to some extent by construction activity brought about by the Government's public works program.

Republic's Earnings Increased

Republic Steel Corpn. earned $1,834,235 during the first quarter of 1935 after deductions for maintenance, depreciation, interest, taxes, etc. This compares with a net loss of $1,266,270 during the last quarter of 1934 and a loss of $58,682 during the first quarter of last year.

Strike Grips Another Chevrolet Plant; Other G. M. Plants Are Threatened

DETROIT, April 30.—Members of the United Automobile Workers' Federal Union employed at Chevrolet's Norwood, Ohio, assembly plant struck this morning and union workers at the Buick Motor Co., Flint, Mich., have requested a conference by 4 p. m. today with W. S. Knudsen, executive vice-president of General Motors Corpn., to discuss grievances. The action at Buick is understood to have been precipitated by the transfer to Flint of the manufacture of Pontiac transmissions from Chevrolet's Toledo plant, where a strike is on. It would not be surprising should a strike be precipitated at Buick before the end of the week, thereby causing a shutdown of not only Buick itself but also Pontiac and Olds, for which Buick builds parts.

It apparently is the purpose of the A. F. of L. to try to cause a shutdown of all General Motors divisions as a result of the refusal of Mr. Knudsen to negotiate further with strikers at Toledo. Mr. Knudsen has declared publicly that there is nothing to discuss until the men return to work. No representatives of either the Chevrolet or General Motors management appeared at the strikers' mass meeting on Friday night, although they had been invited.

General Motors takes the position that the Toledo strike action on the part of the A. F. of L. is indefensible. Under no circumstances will General Motors Corpn. enter into a written agreement with an A. F. of L. local. It is apparent that it thinks the time has arrived for a showdown as to whether the automobile industry is to remain an open shop industry free from the constant threat of union strikes, and hence it is prepared to go to whatever lengths are necessary to maintain its independent position.

Meanwhile Fisher Body has asked for holdups of steel shipments to Cleveland and to other plants working on Chevrolet bodies, and the Chevrolet gear and axle plant has told steel mills that suspension of May shipments may be ordered. Kelsey Hayes Wheel Corpn. is said to have orders to stop production of Chevrolet wheels tomorrow until the situation clears, and a complete tie-up of Chevrolet operations throughout the country is in prospect. With the further possibility that other General Motors units, particularly Pontiac, will shortly be affected by strike developments, motor car production calculations for May seem likely to be completely upset. It is believed that Chevrolet will not be ready to make transmissions in satisfactory volume at Muncie, Ind., for several weeks.

Cleveland Fisher Plant Closed

CLEVELAND, April 30. — The Fisher Body plant in Cleveland which makes the Chevrolet bodies is being closed down today because of the strike in the Chevrolet transmission plant in Toledo, which is halting the assembly of Chevrolet cars. All shipments of steel to the Cleveland plant, amounting at present production schedules to 2000 tons a day mostly in sheets, were ordered suspended and the 9000 employees were notified not to return to work after they finished their day's turn. Shutting down of other Chevrolet plants probably will be necessitated.

PERSONALS

JAMES CAVEN FOSTER, who since January, 1932, has been manager of wire sales for the Jones & Laughlin Steel Corpn., has been appointed general manager of sales to succeed WILLIAM B. TODD, who was made vice-president in charge of sales, as announced in THE IRON AGE of April 25. Mr. Foster's entire business experience has been with the Jones & Laughlin company. He entered its employ in 1913 in the order department and two years later was transferred to the sales department. He had been assistant manager of wire sales for a number of years. A. W. HERRON, JR., who since 1925 has been sales manager of the Cincinnati district, has been made manager of wire sales to succeed Mr. Foster. M. M. HARPER, who has been connected with the Cincinnati office since 1922, has been appointed district sales manager.

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JOHN P. KESSLER, JR., who has been in direct charge of the scheduling of all rolled products for the Carnegie Steel Co. since 1900, has retired. He has served the company continuously for more than 50 years, and holds a Gary Gold Service Medal. His two assistants, MERLE N. SMITH and WALTER J. WELDIN, have been named to succeed him, dividing his responsibilities as managers of the production division and order detail division respectively of the general sales department. Mr. Smith has been identified with the Carnegie company since 1895, having spent all of his time in production and scheduling matters. Mr. Weldin has been manager of the order detail department, under the supervision of Mr. Kessler, since it was established several years ago.

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PAUL B. ALLEN, Detroit district sales manager for the Otis Steel Co. for the past 12 years, has been appointed general manager of sales at Cleveland, succeeding J. G. CARRUTHERS, who continues as vice-president directing sales. Previous to his affiliation with the Otis company, Mr. Allen was connected with the sales department of the Carnegie Steel Co.

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LAWRENCE J. KLINE has been elected vice-president of the Mercury Mfg. Co., Chicago, maker of industrial tractors, trailers, and other material handling equipment. He will continue as general manager of the company, a position he has held for the past seven years. Mr. Kline was born in Beatrice, Neb., and obtained his formal education in the Beatrice schools and at the University of Nebraska. After serving in the Army during the war as a lieutenant in the air service, he joined Mercury as a sales engineer in 1919 and has successively been assistant general manager, general manager and vice-president.

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A. L. PATRICK, who has been treasurer of the Cleveland Automatic Machine Co., Cleveland, was elected executive vice-president and treasurer at the recent annual meeting of the company. H. E. NUNN, who has been vice-president, was named vice-president in charge of sales. WALTER F. BROWN was reelected president and DAVID L. JOHNSON, secretary. H. N. RUPPLE was made chief engineer. A. H. WILLIAMS has been appointed superintendent. He was formerly with the Shaeffer Bearing Co., Chicago.

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E. C. MANNING, Cleveland division Fisher Body Co., has been elected president of the Purchasing Agents' Association of Cleveland for the ensuing year. W. G. WINSHIP, Foote-Burt Co., has been named as first vice-president; F. MEKET, Aluminum Co. of America, second vice-president, and G. A. COLLIER, Cleveland Automatic Machine Co., secretary-treasurer.

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R. B. SANDERS, for a number of years identified with the New York sales organization of the Weirton Steel Co., has been appointed district manager for the same company at Boston. He succeeds W. E. SNELLGROVE, who has been granted a leave of absence because of ill health and will later return to the Weirton New York office. E. T. WEIR, JR., has been transferred to the New York office from Philadelphia, where he has been for the past five years.

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WALTER E. MEUB, vice-president in charge of sales, and J. C. ARGETSINGER, general counsel, have been elected directors of the Youngstown Sheet & Tube Co., Youngstown, Ohio, to fill the vacancies caused by the resignation of S. LIVINGSTON MATHER and GEORGE T. BISHOP.

J. C. FOSTER

A. W. HERRON, JR

M. M. HARPER

J. P. KESSLER, JR.

CHARLES M. POND, manager of the small tool and gage division of the Pratt & Whitney Co., Hartford, Conn., has been elected vice-president, in addition continuing in his former duties. He became identified with the company as an apprentice in 1903 after his graduation from Columbia University. Three years later he was transferred to the sales department in New York and in 1909 was sent to Cleveland, where he opened the company's first small tool store. He was recalled to Hartford in 1914 to become sales manager of the small tool division, and in 1919 was made assistant manager. He became manager in 1923, and five years later was appointed to the position he now holds.

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L. E. HESS, vice-president of the J. G. Brill Co., New York, has been elected executive vice-president. E. L. OERTER has been elected director and treasurer, succeeding E. P. RAWLE.

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W. H. SOMMER has been elected president of the Keystone Steel & Wire Co., Peoria, Ill. R. E. SOMMER has been made vice-president and general manager; C. W. LA PORTE, vice-president; D. P. SOMMER, vice-president and general superintendent, and W. O. FRITZE, assistant treasurer. HENRY G. SOMMER remains as executive vice-president and treasurer. Officers who resigned included: W. C. BUCHANAN, heretofore president and general manager; W. W. BARTON, vice-president; E. P. KASTIEN, general superintendent and purchasing agent; HIRAM E. TODD and A. G. HEIDRICH, formerly of the executive committee, and JOHN V. W. REYNDERS, consulting engineer.

E. A. RIEKE, assistant contracting engineer at St. Louis for the American Bridge Co., was placed in charge of that office on May 1. He will fill the vacancy caused by the death of Edward E. Green on March 30. Mr. Rieke has devoted practically his entire business career with the American Bridge Co., and has been at the St. Louis office for at least 25 years.

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VERNON R. DRUM has been appointed production manager of the Hupp Motor Car Corpn., Detroit.

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WINTHROP W. ALDRICH, H. B. RUST and SAMUEL M. VAUCLAIN were reelected directors of the Westinghouse Electric & Mfg. Co. at the recent annual meeting of stockholders. JOHN L. HALL, Boston attorney, also was named a director.

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SIDNEY G. MCALLISTER, who is first vice-president of the International Harvester Co., has been made president of that company effective May 1. He succeeds ADDIS E. MCKINSTRY, who has resigned becase of poor health.

Mr. McAllister started service with the company in 1897 as an office boy at the McCormick works. A series of rapid promotions carried him upward to the superintendency of the Auburn plant in 1911. Three years later he was transferred to European service. Upon his recall to this country in 1931 he was elected a vice-president and was made first vice-president last May. Mr. McKinstry will continue as a director.

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R. Y. MACINTYRE, who has served Link-Belt Co. as its representative in Memphis, Tenn., since 1932, has been transferred to the company's district sales office and warehouse at Dallas, Tex., where he will assist E. G. WENDELL, the local manager.

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F. R. MILLER has been elected vice-president in charge of sales of the Consolidated Expanded Metal Companies, Wheeling, W. Va. He has been with the company in various sales capacities for 12 years. His prior connection was with General Fireproofing Co., Youngstown. The Consolidated Expanded Metal Companies is a subsidiary of Wheeling Steel Corpn., Wheeling, W. Va.

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J. J. MCDERMOTT has been elected vice-president and general manager of the partially reorganized Wrought Iron Co., Lebanon, Pa.; VINCENT F. ACHE has been made treasurer and CHARLES A. DONNLEY, secretary.

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N. W. PICKERING, president, Farrel-Birmingham Co., Inc., Ansonia, Conn., and Buffalo, sailed for Europe on the Britannic on April 8 for a two months' trip. The trip is one combining business with vacation, and Mr. Pickering will spend some time with the company's representatives in England, France, Sweden and Norway. He also will visit Germany and Italy.

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J. C. GOFF, Pittsburgh manager, Scully Steel Products Co., was elected president of the Pittsburgh chapter of the American Steel Warehouse Association, Inc., at a recent meeting. The secretary-

(CONTINUED ON PAGE 80)

M. N. SMITH

W. J. WELDIN

P. B. ALLEN

L. J. KLINE

Current Metal Working Activity Statistically Shown

These Data Are Assembled By THE IRON AGE From Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

Raw Materials:	March, 1935	February, 1935	March, 1934	Three Months, 1935	Three Months, 1934
Lake ore consumption (gross tons)[a]	2,582,968	2,467,269	2,189,566	7,319,780	5,573,615
Coke production (net tons)[b]	**3,012,692**	2,873,432	3,129,973	8,775,676	8,336,252
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	1,777,028	1,608,552	1,619,534	4,862,916	4,098,433
Pig iron output—daily (gross tons)[c]	57,098	57,448	52,243	54,032	45,381
Castings:					
Malleable castings—production (net tons)[d]	**42,808**	41,377	43,438	127,585	107,794
Malleable castings—orders (net tons)[d]	**40,237**	41,225	42,961	126,030	112,056
Steel castings—production (net tons)[d]	.....	29,687	39,491	.....	95,661
Steel castings—orders (net tons)[d]	.....	31,725	60,046	.....	122,040
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	2,830,700	2,742,125	2,761,438	8,406,995	6,915,785
Steel ingot production—daily (gross tons)[e]	108,873	114,255	102,275	**109,182**	**88,664**
Steel ingot production—per cent of capacity[e]	49.18	51.61	46.45	**49.32**	**40.27**
Employment in Steel Industry:					
Total employees[e]	**425,189**	420,397	419,277	417,552	405,196
Total payrolls (thousands of dollars)[e]	**46,765**	44,213	41,263	135,306	112,566
Average hours worked per week[e]	**33.9**	35.6	33.3	34.4	32.4
Finished Steel:					
Trackwork shipments (net tons)[e]	.....	2,892	4,446	.....	10,597
Sheet steel sales—(net tons)[f]	193,057	184,355	158,244	698,210	552,062
Sheet steel production (net tons)[f]	227,082	219,062	220,282	681,858	578,734
Fabricated shape orders (net tons)[g]	**99,327**	70,980	105,537	230,558	272,425
Fabricated shape shipments (net tons)[g]	**82,410**	65,430	65,728	233,995	170,860
Fabricated plate orders (net tons)[d]	.....	15,064	38,924	.....	69,462
Reinforcing bar awards (net tons)[e]	17,335	22,265	19,300	55,200	51,300
U. S. Steel Corpn. shipments (tons)[h]	668,056	583,137	588,209	1,785,348	1,305,486
Ohio River Steel Shipments[hh]	75,072	64,369	47,897	192,097	106,379
Fabricated Products:					
Automobile production U. S. and Canada[dd]	451,805	358,658	345,443	1,113,835	749,532
Construction contracts (37 Eastern States)[i]	$123,043,500	$75,047,400	$178,345,800	$297,864,500	$461,525,800
Steel barrel shipments (number)[d]	.....	402,928	703,101	.....	1,982,362
Steel furniture shipments[d]	**$1,220,533**	$1,064,219	$955,633	$3,424,249	$2,846,547
Steel boiler orders (sq. ft.)[d]	**655,812**	281,646	375,774	1,329,242	838,643
Locomotive orders (number)[k]	8	1	3	9	23
Freight car orders (number)[k]	0	806	522	830	20,899
Machine tool index[l]	62.3	53.0	48.1	†60.3	†50.9
Foundry equipment index[ll]	69.3	75.7	75.4	†77.2	†59.5
Foreign Trade:					
Imports of pig iron (gross tons)[m]	.....	10,741	20,674	.....	43,337
Imports of rolled steel (gross tons)[m]	.....	11,024	6,822	.....	20,461
Exports of all rolled steel and iron (gross tons)[m]	**323,035**	63,739	87,916	.....	253,309
Exports, finished steel (gross tons)[m]	.....	**59,147**	**79,854**	.....	**227,394**
Exports of scrap (gross tons)[m]	**228,338**	156,332	173,165	.....	336,321
British Production:					
British pig iron production (gross tons)[n]	553,200	483,100	503,600	1,557,500	1,359,300
British steel ingot production (gross tons)[n]	841,900	769,500	834,500	2,369,200	2,253,000
Non-Ferrous:					
Lead production (net tons)[e]	**32,558**	27,495	35,502	89,367	108,421
Lead shipments (net tons)[e]	**28,960**	32,523	30,321	95,178	90,010
Zinc production (net tons)[p]	36,216	33,072	33,845	104,902	97,218
Zinc shipments (net tons)[p]	41,137	34,903	32,877	111,578	92,018
Deliveries of tin (gross tons)[r]	5,495	3,905	3,835	14,000	10,085

[e]Preliminary. †Three Months' Average.

Sources of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [dd] When preliminary, from Automobile Manufacturers' Association—Final figures from Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [hh] U. S. Engineer, Pittsburgh; [i] F. W. Dodge Corpn.; [k] *Railway Age;* [l] National Machine Tool Builders Association; [ll] Foundry Equipment Manufacturers Association; [m] Department of Commerce; [n] British Iron and Steel Federation; [o] American Bureau of Metal Statistics; [p] American Zinc Institute, Inc.; [r] New York Commodities Exchange.

Pig Iron Production Off 2.8 Per Cent in April

Ingot Output Now Averages 46 Per Cent With Future Course Obscured By Labor Difficulties in Automobile Industry—Scrap Is Steady

PIG IRON production in April totaled 1,664,000 tons as compared with 1,770,028 tons in March. The daily rate in April, at 55,470 tons, represented a decline of 2.8 per cent from the March average of 57,098 tons a day. Ninety-seven furnaces were in blast on May 1 as against 98 on April 1, a net loss of one.

CURRENT steel production, at 46 per cent of capacity, is one point lower than a week ago. Operations have risen seven points to 95 per cent at Detroit, but are off one and one-half points to 52 per cent at Chicago, five points to 51 per cent in the Valleys, four points to 48 per cent in the Cleveland-Lorain district, and eight points to 27 per cent at Buffalo. Elsewhere output is substantially unchanged.

In contrast with the drop in ingot output, scrap prices are giving a demonstration of stability in virtually all markets. Recent advances in freight rates have helped to steady prices, and in the East heavier exports have been a factor. An increase in heavy melting steel at Philadelphia has lifted THE IRON AGE scrap composite from $10.33 to $10.42 a ton.

DEFINITE trends in steel demand are still lacking. The flow of steel to the automotive industry has tapered, but the recession has been due to strikes at a Michigan steel mill and at two Chevrolet plants rather than to any appreciable decline in the requirements of motor car makers. Steel releases from manufacturers unaffected by labor disputes have shown little change despite the fact that the peak of this year's bulge in production has apparently been passed. April assemblies are estimated at 475,000 units, and preliminary schedules for May call for 440,000, though that total may not be attained if labor trouble continues to spread.

Tin plate output has dipped five points to 80 per cent of capacity, but this setback is regarded as temporary, since ultimate consumption is expanding rather than contracting. Demand for wire products has receded moderately, but present mill operations of 50 per cent are expected to be maintained for at least another month.

Farm implement makers are beginning to feel a seasonal falling off in business and stove makers will soon have to curtail, but tractor manufacturers are booked in excess of their ability to deliver, with some plants enjoying the best trade in their history.

Demand for heavy-rolled products remains subnormal, though the long-range outlook is favorable in view of the extensive public works projects planned under the Federal works relief bill.

HIGHER iron and steel prices for third quarter, which have been under consideration ever since the freight surcharges were imposed, have not passed the discussion stage. Iron ore, on which the freight rate increase is 11.2c. a gross ton, has been reaffirmed at the prices that have prevailed for the past six years. Cold-finished bars may be advanced to offset the recent $3 a ton decrease which, owing to the absence of a comparable decline in hot-rolled bars, is proving onerous to non-integrated makers. The general disposition of the steel trade, however, is to await the extension or revision of the recovery act before taking any steps to alter the price structure.

FABRICATED structural steel awards total 15,250 tons, of which 9350 tons is for Government dams. New projects of 6850 tons compare with 12,250 tons last week and 5700 tons two weeks ago. Structural steel contracts in April aggregated 60,275 tons as against 79,150 tons in March and 46,105 tons in February.

Vessels provided for in the new Naval bill, passed by the House, will require 46,000 tons of steel, but it will be late summer or early fall before orders for any of this material can reach mill books.

The Chicago & Eastern Illinois has bought 2500 tons of rails and 500 tons of tie plates, and the Pere Marquette is in the market for 1100 tons of rails.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.124c. a lb. and $17.90 a ton respectively. The recent advance of $1 a ton on cast iron pipe has now become generally effective.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Apr. 30, 1935	Apr. 23, 1935	Apr. 2, 1935	May 1, 1934
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	19.13
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	18.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	19.76
Basic, Valley furnace	18.00	18.00	18.00	18.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	20.76
Malleable, Chicago*	18.50	18.50	18.50	18.50
Malleable, Valley	18.50	18.50	18.50	18.50
L. S. charcoal, Chicago	24.2528	24.2528	24.04	24.04
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	29.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	30.00
Slabs, Pittsburgh	27.00	27.00	27.00	29.00
Forging billets, Pittsburgh	32.00	32.00	32.00	34.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.90
Bars, Chicago	1.85	1.85	1.85	1.95
Bars, Cleveland	1.85	1.85	1.85	1.95
Bars, New York	2.15	2.15	2.13	2.23
Plates, Pittsburgh	1.80	1.80	1.80	1.85
Plates, Chicago	1.85	1.85	1.85	1.90
Plates, New York	2.0926	2.0926	2.08	2.13
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.85
Structural shapes, Chicago	1.85	1.85	1.85	1.90
Structural shapes, New York	2.063175	2.063175	2.05¼	2.10¼
Cold-finished bars, Pittsburgh	1.95	1.95	2.10	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	2.00
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.80

Finished Steel

Per Lb.:	Apr. 30, 1935 Cents	Apr. 23, 1935 Cents	Apr. 2, 1935 Cents	May 1, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.65
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.75
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.25
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.35
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	2.00
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	2.10
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., P'gh	3.00	3.00	3.00	3.00
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	3.05
Tin plate, 100 lb. box, P'gh.	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$11.50	$11.50	$11.75	$13.75
Heavy melting steel, Phila.	**10.00**	9.75	10.25	11.25
Heavy melting steel, Ch'go	9.75	9.75	10.25	11.50
Carwheels, Chicago	10.50	10.50	10.50	11.50
Carwheels, Philadelphia	11.25	11.25	11.25	12.75
No. 1 cast, Pittsburgh	12.25	12.25	12.25	13.75
No. 1 cast, Philadelphia	11.00	11.00	11.00	13.00
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.00	9.25
No. 1 RR. wrot., Phila	*10.25*	10.75	10.75	12.50
No. 1 RR. wrot., Ch'go (net)	8.00	8.00	8.00	9.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$3.85
Foundry coke, prompt	4.60	4.60	4.60	4.60

Metals

Per Lb. to Large Buyers:				
Electrolytic copper, refinery‡	8.75	8.75	8.75	8.25
Lake copper, New York‡	9.12½	9.12½	9.12½	8.62½
Tin (Straits), New York	**50.75**	50.62½	48.00	54.65
Zinc, East St. Louis	4.10	4.10	3.90	4.40
Zinc, New York	4.45	4.45	4.25	4.75
Lead, St. Louis	3.60	3.60	3.50	4.10
Lead, New York	3.75	3.75	3.65	4.25
Antimony (Asiatic), N. Y.	14.25	14.25	14.50	7.95

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
April 30, 1935	2.124c. a Lb.	$17.90 a Gross Ton	$10.42 a Gross Ton
One week ago	2.124c.	17.90	10.33
One month ago	2.124c.	17.90	10.75
One year ago	2.199c.	17.90	12.17

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Steel Scrap HIGH	Steel Scrap LOW
1935	2.124c., Jan. 8;	2.124c., Jan. 8	$17.90, Jan. 8;	$17.90, Jan. 8	$12.33, Jan. 8;	$10.33; April 23
1934	2.199c., April 24;	2.008c., Jan. 2	17.90, May 1;	16.90, Jan. 27	13.00, Mar. 13;	9.50, Sept. 25
1933	2.015c., Oct. 3;	1.867c., April 18	16.90, Dec. 5;	13.56, Jan. 3	12.25, Aug. 8;	6.75, Jan. 3
1932	1.977c., Oct. 4;	1.926c., Feb. 2	14.81, Jan. 5;	13.56, Dec. 6	8.50, Jan. 12;	6.42, July 5
1931	2.037c., Jan. 13;	1.945c., Dec. 29	15.90, Jan. 6;	14.79, Dec. 15	11.33, Jan. 6;	8.50, Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9	18.21, Jan. 7;	15.90, Dec. 16	15.00, Feb. 18;	11.25, Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29	18.71, May 14;	18.21, Dec. 17	17.58, Jan. 29;	14.08, Dec. 3
1928	2.286c., Dec. 11;	2.217c., July 17	18.59, Nov. 27;	17.04, July 24	16.50, Dec. 31;	13.08, July 2
1927	2.402c., Jan. 4;	2.212c., Nov. 1	19.71, Jan. 4;	17.54, Nov. 1	15.25, Jan. 11;	13.08, Nov. 22

Well Defined Trends Lacking at Pittsburgh

Ingot Output Unchanged Locally and in Wheeling District But Declines to 51 Per Cent in Valleys—Scrap Is Steady

PITTSBURGH, April 30.—Demand for finished steel is fairly well sustained. Shipments are running possibly slightly ahead of new orders, but it is impossible to observe any definite trends in the current steel market.

As reflected in finishing mill operations, little change can be detected. The only important revision in prospect for this week is in tin plate production, which is down five points to 80 per cent as a consequence of curtailment at the leading independent plant. Sheet production is holding steadily at 65 to 70 per cent, as is strip output at around 50 per cent. A modicum of improvement in pipe demand has not yet influenced tube mill production, which is steady at 40 to 50 per cent in this district.

A further reflection of the steadiness of the Pittsburgh steel market is in steel ingot output, which is unchanged at 35 per cent for the seventh consecutive weekly period. In the Valleys and nearby northern Ohio mills output has been scaled down five points to 51 per cent, while production in the Wheeling district is holding at 77 per cent.

While the outlook for flat-rolled steel demand is dampened by prospects of diminishing automotive consumption later in the second quarter, the long range view is more cheerful for heavy hot-rolled products, which should benefit by the extensive public works projects planned under the Federal relief works bill. The proposal to spend a large part of the relief money for railroad grade crossing elimination brings a small measure of encouragement to Pittsburgh rail producers, but it is not believed that such work could mature until late in the year. Meanwhile railroad buying and general demand for structural steel are disappointing.

Although considerable talk of higher prices for third quarter persists, there is no clear indication as to the early course of quotations. For the time being steel producers are awaiting the expiration of the NIRA and probably will await extension or revision of the national recovery measure before definitely setting up any new steel code provisions relating to prices. While some advances may economically be justified as a result of higher freight charges on raw materials, it is agreed by some producers in the Pittsburgh district that a balancing of the present price structure may be effected but that no general price advance will occur in the coming quarter.

Pig Iron

Shipments are moving at a fairly steady rate, but aggregate tonnage for April will not show a marked increase over March deliveries. Miscellaneous castings orders are reported to be increasing, and jobbing foundries in this district have expanded melts on a moderate scale. No stocking of pig iron, however, is under way, either by large mills or small consumers. The emergency freight surcharges still are not being applied to shipments within Pennsylvania, and will not become effective until the State's transportation body decides upon the status of the I.C.C. ruling as it applies to intrastate freight shipments.

Semi-Finished Steel

Sustained non-integrated mill operations are accounting for a steady movement of semi-finished grades, with sheet bars for tin plate conversion still leading. Skelp is in good demand. The movement of wire rods is nearing the seasonal peak.

Rails and Track Accessories

The Erie Railroad has obtained approval of Federal loan for the purchase of about 17,800 tons of rails and 5200 tons of companion fastenings, which may be placed in May. Another Government loan has been sanctioned for the Akron, Canton & Youngstown Railroad for the purchase of 7400 tons of rails and accessories. Miscellaneous track business is fair. The proposal to spend a large share of the latest relief works funds for railroad crossing elimination portends a future substantial demand for rails and accessories, necessary in the relocating of tracks in such work.

Bolts, Nuts and Rivets

April bookings will run slightly less than those for March. Absence of railroad buying is being felt keenly by producers here. Current low output is for miscellaneous requirements. Lower discounts effected April 1 are resisting weakness, despite the poor general demand.

Reinforcing Steel

A moderate tonnage of rail or new billet steel reinforcing will be purchased for a sea wall at Monroe, La., on which bids are being taken by the United States Engineer office at Vicksburg, Miss. If Federal plans to eliminate railroad grade crossings with relief works funds materialize, a large tonnage of reinforcing steel will be required. The immediate market, however, is offering little sustenance to mill schedules, which probably will remain curtailed until Government money is released. Only a smattering of private work is reported.

Cold-Finished Bars

Orders are appearing in satisfactory volume, but are not so frequent as they were two weeks ago. April shipments probably will equal those in March. Automotive business is sustained, while demands from the farm implement industry have not diminished. Jobbers are slightly more active. The recent $3 a ton decrease in the base price of cold-finished bars is proving to be a hardship to some non-integrated mills, and a movement is in progress for the restoration of at least a part of the decrease effected April 11. In the event of higher prices for the coming period, the anticipatory buying movement attending announcement of higher base prices would defer any measurable benefits to non-integrated mills until well into third quarter.

Plates and Shapes

The American Oil Co., Baltimore, is expected to enter the market soon for eight all-welded steel tank oil barges and 26 tanks. Plans are being concluded for the installation of storage equipment at the company's recently acquired property at Hays, Pa. The barges probably will be 192 ft. long, 35

ft. wide and 8 ft. deep, with a capacity of 8000 bbl. each. General barge inquiries are more numerous, possibly owing to application of surcharges to rail freight rates.

New structural steel inquiry is featured by 8500 tons to be specified in contract No. 37 for the Harlem River crossing of the Triborough bridge, New York, for which bids are being taken until May 16. A post office at St. Louis will require 7000 tons. Awards reported here for the past week were in extremely small volume. Structural prospects now point largely to allocation of Federal money under the latest public works relief bill. Construction work under the Allegheny County Authority is not yet beyond the blue print stage, and local politics continue to hinder the materializing of original plans.

Tubular Products

Although demand is tending slightly upward, it is difficult to trace improvement in the aggregate movement of tubular goods. April shipments probably will be on a parity with March deliveries. Producers are rather hopeful of at least a slight upturn in general activity in May. Home building is creating a slightly improved demand for standard pipe. Oil-country goods are in steady demand and are expected to move more rapidly if and when Government pressure on the oil industry's affairs is relaxed. A substantial miscellaneous demand will be built up by Government relief expenditures, but such business can now only be vaguely estimated.

Bars

This market is holding its own, and some bar producers are expecting sustained activity during May. This favorable viewpoint is based on immediate prospects for additional automotive buying, sustained bookings by the farm implement industry and a steady flow of miscellaneous tonnage. The dust storms in the Middle West, instead of reflecting unfavorably in agricultural equipment needs, are creating broader requirements for machinery and tractors adapted to cope with soil erosion conditions.

Wire Products

Demand is nearing a seasonal peak, and wire mill schedules in this district are well supported at 40 to 50 per cent. A good deal of the current activity is sponsored by calls for manufacturers' wire, while the movement of merchant items is not measuring up to seasonal expectations. Demand for road mesh will improve when Federal relief works money finally is allotted for various State and County road building projects.

Sheets

A drop in miscellaneous sheet orders in the past week was offset by a slight improvement in automotive tonnage, and production for the sheet industry this week probably will be sustained at 65 to 70 per cent. Labor difficulties at the Chevrolet Toledo plant have not noticeably affected mills in the Pittsburgh district. Demand for galvanized roofing has slumped sharply. Despite pressure of distributers for greater allowance per ton, following the concession of $4 instead of the previous spread of $2 a ton, on certain gages of galvanized roofing, it is considered doubtful that sheet producers will make any further revisions in base quotations to jobbers.

Tin Plate

Specifications on contracts are appearing less frequently, but the lull in general releases is considered a natural condition after many weeks of unusually heavy shipments. A large independent producer this week has suspended its hot mill operations, while most other producers are practically maintaining recent production. The general trend in output, however, is slightly downward, and production for the tin plate industry this week probably will not exceed 80 per cent. Fluctuations undoubtedly will be frequent, as most tin plate operators are working on small backlogs, which are quickly pared down in the absence of supporting specifications. Ultimate consumption of tin plate is reported to be unusually heavy, and there is little concern among producers in this district as to the present downward tendencies.

Strip Steel

This market, while devoid of new feature, is encouraging in its steadiness. Recent automotive tonnage increased slightly, while miscellaneous business is keeping an even pace and as yet shows no signs of stumbling. Agricultural implement concerns are ordering a bit more freely. Strip is moving in satisfactory volume for locker and shelving manufacture, which is approaching a more or less seasonal bulge. Refrigerator makers are exceptionally busy and are relatively important in the current strip market. Hot-rolled strip output this week is expected to hold at 50 per cent. Cold-rolled output is a few points higher.

Coke and Coal

Considering the heavy stocking of bituminous coal prior to April 1, the present reduced movement is comparatively satisfactory. Small industrial plants, which are experiencing a fairly steady activity, are taking coal regularly. The railroads, which covered rather heavily in anticipation of labor outbursts on April 1, are reported to be liquidating some of their surplus stocks. Slack is not nearly so plentiful as it was some months ago, despite a rather poor Lake movement thus far this season. Intrastate movement of bituminous coal in Pennsylvania has increased since application of rail freight surcharges, but this increase reported by carriers operating within the State is due almost entirely to the diversion of tonnage from other Eastern roads whose lines pass through neighboring States, making haulage interstate and requiring assessment of the surcharges up to 15c. a ton. Little hope is held out for relief from the surcharges as a result of a prospective rehearing by the Interstate Commerce Commission of complaints from the National Coal Association. Interest in this district is focused more largely on the Guffey bill, which will be discussed at a meeting this week of small western Pennsylvania independent mine operators.

Scrap

Dealer trading constitutes the bulk of activity in this market. Although mills remain out of the market, trade sentiment has not dampened in the past week, and some dealers are covering unfilled orders at even figures and in some instances at losses. Brokers with $11.25 heavy melting steel orders have not been able to pick up any scrap to cover at that price. All grades this week are nominally unchanged. A more specific trend in scrap prices probably will be discernible upon the opening of bids on latest railroad lists. The Pennsylvania Railroad will open tenders on May 1 covering 21,200 tons of scrap, of which 5300 tons is heavy melting steel. The Baltimore & Ohio list, which closes on May 6, covers about 12,000 tons, including 2500 tons of No. 1 steel.

Housing Program Reported to President

PLANS are rapidly taking shape for low cost housing projects in 16 cities and can be under way by mid-August, it has been reported to the President by Harold L. Ickes, PWA administrator, and Col. H. Hackett. They indicated that about $100,000,000 will be used to get the program well under way and that eventually the total involved will be $350,000,000.

Chicago Rate Is Off 1½ Points to 52 Per Cent

Demand From Automobile and Implement Industries Tapers But Tractor Output Is Undiminished—Stove Foundries Near End of Season

CHICAGO, April 30.—Ingot production has dropped one and one-half points to 52 per cent of capacity. This change is accounted for by a downward revision in output by a producer who heretofore has held a steady rate when others were varying.

All reports indicate that miscellaneous trade is holding, but specifications from automobile centers are lighter and there is some indication that farm machinery that is taken in season is in smaller demand. Tractor plants are still very busy and they see no recession ahead of them until well into the summer. Observers point out that so far this year the farmer has been busy making what may be termed the more essential purchases, such as roofing, fencing, tractors, and necessary machinery, and it is expected that his next move will be to enter the automobile market in a broad way.

Both rain and snow have settled the dust in western Kansas and the crop situation west of the Missouri River has improved.

Output of wire has been scaled down to 50 per cent of capacity, which approximates actual shipments, and therefore stocks are not being expanded. If this plan is followed through by producers, operations will react quickly to the stimulus of better trade, which is expected in August.

Scrap dealers and brokers, who have been talking higher prices, have received a jolt with the decline in ingot output. Consumers generally have not been infected by the enthusiasm which has gripped the scrap trade.

Pig Iron

It is estimated that automobile foundries have cut operations by about 3 per cent, but satisfactory schedules are laid out for May. Stove foundries are very close to the season when demand declines abruptly. April shipments of pig iron topped March by fully 20 per cent, and new buying in the month now closing kept pace with shipments so that order books show practically no shrinkage. There is no definite move to advance prices, but producers point out that the freight surcharges add from 45c. to 55c. to the cost of producing a ton of pig iron.

Cast Iron Pipe

Producers are now in line on the $1 a ton advance. Lots of less than 200 tons each, in 6-in. and larger diameters, are now being quoted $40 a ton, Birmingham, or $48.40 delivered Chicago. Nicholas Santucci is low on the general contract at Aurora, Ill., and the Sanitary District, Chicago, is ordering some specials. Otherwise the market is very quiet. Awards are confined to a few small contractor's jobs, and fresh inquiries, now very few in number and small in size, will not revive until Government money again begins to flow in larger volume.

Reinforcing Bars

The pace being set by this market is slower and shops are more erratic in their rates of operations. The bulk of going business consists of small post offices, scattered and small road tonnages, and some small private work that usually consists of repairs and alterations. However, an attractive amount of preliminary figuring is being done. Plans are now ready on the 100-ton sewerage plant at Waukegan, Ill., and the expected flow of new Federal money is being counted on to add life to the market.

Wire Products

April shipments were about 10 per cent under the March volume, but March was an exceptional month as measured by performance in recent years. The first four months of this year were more than 60 per cent heavier in orders than the corresponding period in 1934. The answer can be found in the fact that little tonnage was added to books in the contracting period for the first quarter of this year, whereas books were well loaded for the first quarter of 1934. Output reached a high of 55 per cent, but has now been scaled down to 50 per cent, where it may be held for a time for the reason that producers view the next 30 to 45 days as favorable. Wire rope is moving in better volume. Demand for wire products from railroads and public utilities is sluggish.

Plates

Although there is a fair sprinkling of orders, it is seldom that one appears that is for more than a carload. The reason is that most tonnage moving from plate mills is going into structural projects. Small use is being made of steel in railroad repair shops, and there is little on the cards in the way of railroad equipment with the exception of the possibility that the Burlington may decide later to build some hopper cars. About 200 tons will be used for a water tank at Marion, Wis.

Bars

Tractor plants still hold top place in industrial activity in this district. In fact, it is said that in so far as manufacturers are concerned there is not an unsold tractor in the country. Some plants have orders booked far in excess of ability to deliver and some units are enjoying the best trade in their history. In general lines of farm implements there are some signs that the peak of spring production has been reached, if not actually passed. Shipments to automobile plants are virtually unchanged in aggregate volume, but are being made in smaller and more frequent lots. Miscellaneous users are still active in the market.

Sheets

Backlogs are dropping at a faster rate and there is some downward adjustment in the rate of operations. This is due principally to slightly smaller consumption by automobile and farm implement manufacturers. Orders are brisk from miscellaneous users.

Structural Material

Structural awards are very light, at about 2000 tons, which includes about a dozen small lettings of less than 100 tons each. New inquiries have fallen back markedly from a week ago, but fabricators estimate that fully 40,000 tons of new business is in the making. An additional allotment has been made for the Alton, Ill., dam, so that the low bid which was in excess of the engineers' estimates can be covered. Easements are

(CONTINUED ON PAGE 77)

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.09c.
Del'd New York	2.15c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Dansville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.70c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	1.95c.
F.o.b. Chicago	2.00c.
F.o.b. Gary	2.00c.
F.o.b. Cleveland	2.00c.
F.o.b. Buffalo	2.05c.
Del'd Detroit	2.15c.
Del'd eastern Michigan	2.20c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts	*Base per Net Ton*
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	63.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.99795c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.985c.
Del'd New York	2.0926c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.99795c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.005c.
Del'd New York	2.063175c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.14c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.79c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.24c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 24, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.39c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast ports	3.35c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.8926c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

F.o.b. Pittsburgh only on wrought iron pipe

Butt Weld

Steel Inches	Black	Galv.	*Wrought Iron* Inches	Black	Galv.
⅛	51½	29½	⅛	+91½	+138
¼ to ⅜	53½	35	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Cold Drawn	Hot Rolled
1 in. o.d.	13	B.W.G.	$ 8.60	$7.32
1¼ in. o.d.	13	B.W.G.	10.19	9.26
1½ in. o.d.	13	B.W.G.	11.26	10.23
1¾ in. o.d.	13	B.W.G.	12.81	11.64
2 in. o.d.	13	B.W.G.	14.35	13.04
2¼ in. o.d.	13	B.W.G.	16.00	14.54
2½ in. o.d.	12	B.W.G.	19.29	17.54
2¾ in. o.d.	12	B.W.G.	20.45	18.59
3 in. o.d.	12	B.W.G.	21.45	19.50
4½ in. o.d.	10	B.W.G.	41.08	37.35
3½ in. o.d.	11	B.W.G.	27.09	24.62
4 in. o.d.	10	B.W.G.	33.60	30.54
4½ in. o.d.	10	B.W.G.	41.08	37.35
5 in. o.d.	9	B.W.G.	51.56	46.87
6 in. o.d.	7	B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
10,000 lb or ft to 24,999 lb. or ft.	12½%
2,000 lb. or ft. to 9,999 lb. or ft.	25 %
Under 2,000 lb. or ft.	40 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Steel	*Iron*
1½ in. o.d.	13	B.W.G.	$ 9.72	$20.16
1¾ in. o.d.	13	B.W.G.	11.06	21.84
2 in. o.d.	13	B.W.G.	12.38	17.23
2¼ in. o.d.	13	B.W.G.	13.79	19.58
2½ in. o.d.	12	B.W.G.	16.58	24.19
2¾ in. o.d.	12	B.W.G.	17.54	26.46
3 in. o.d.	12	B.W.G.	18.35	28.39
3¼ in. o.d.	11	B.W.G.	21.56	33.95
3½ in o.d.	11	B.W.G.	23.15	36.16
4 in. o.d.	10	B.W.G.	28.66	45.36
4½ in. o.d.	10	B.W.G.	35.22	56.48
5 in. o.d.	9	B.W.G.	44.25	61.86
6 in. o.d.	7	B.W.G.	68.14	102.66

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½%
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$48.40
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.00
4-in. del'd New York	48.00
*6-in. and larger, Birmingham	40.00
*4-in. Birmingham	43.00

Class "A" and gas pipe, $3 extra.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.27½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

Base per 100 Lbs.	
Spikes, 9/16 in. and larger	$2.40
Spikes, ⅜ in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.55
Track bolts, no jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts .....70, 10 and 5
Carriage bolts .....70, 10 and 5
Lag bolts .....70, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7 heads .....70, 10 and 5
Hot-pressed nuts, blank or tapped, square .....70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons .....70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped .....70, 10 and 5
Semi-finished hexagon nuts, U.S.S., all sizes .....70, 10 and 5
Semi-finished hexagon nuts, S.A.E. ¼ in. to 7/16 in. diameter..70, 10 and 5
½ in. to 1 in. diameter....70, 10 and 5
larger than 1 in. diameter..70, 10 and 5
Store bolts in packages, Pittsburgh.. 75
Store bolts in packages, Chicago.... 75
Store bolts in packages, Cleveland.... 75
Store bolts in bulk, Pittsburgh..... 83
Store bolts in bulk, Chicago..... 83
Store bolts in bulk, Cleveland..... 83
Tire bolts .....60 and 5

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland.....$2.90
F.o.b. Chicago 3.00
F.o.b. Birmingham 3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh .....70 and 5
F.o.b. Cleveland .....70 and 5
F.o.b. Chicago and Birm'g'm....70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller .....80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller....75
Milled headless set screws, cut thread ¾ in. and smaller 75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller 85
Upset set screw, cut and oval point 75 and 10 to 80
Milled studs .....65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base .....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (1¼% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar.	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ¼c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2¼ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.85c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)

(Base Prices, f.o.b. Pittsburgh)

Per Lb.

Forging billets .....19.55c.
Rerolling slabs ..... 15c.
Bars ..... 22c.
Plates ..... 26c.
Structural shapes ..... 22c.
Sheets ..... 33c.
Hot-rolled strip .....20¾c.
Cold-rolled strip ..... 27c.
Drawn wire ..... 22c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Uncropped .....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham. Uncropped .....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland. Youngstown, Buffalo, Birmingham.

Per Gross Ton

Rerolling $27.00
Forging quality 32.00

Delivered Detroit

Rerolling $30.00
Forging 35.00

Billets Only F.o.b. Duluth

Rerolling $29.00
Forging 34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer $28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved ..... 1.70c.
Universal ..... 1.70c.
Sheared ..... 1.70c.

Tube Rounds

Base per Lb.

F.o.b. Pittsburgh ..... 1.80c.
F.o.b. Chicago ..... 1.85c.
F.o.b. Cleveland ..... 1.85c.
F.o.b. Buffalo ..... 1.90c.
F.o.b. Birmingham ..... 1.95c.

Wire Rods

(Common, base)

Per Gross Ton

F.o.b. Pittsburgh $38.00
F.o.b. Cleveland 38.00
F.o.b. Chicago 39.00
F.o.b. Anderson, Ind. 39.00
F.o.b. Youngstown 39.00
F.o.b. Worcester, Mass. 40.00
F.o.b. Birmingham 41.00
F.o.b. San Francisco 47.000
F.o.b. Galveston 44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn From East. Pa.	21.9289	22.4289	21.9289	22.9289
Newark or Jersey City, N. J. From East. Pa.	20.9873	21.4873	20.4873	21.9873
Philadelphia From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio From Hamilton, Ohio	20.50	20.50	....	....
Mansfield, Ohio From Cleveland and Toledo..	20.26	20.26	....	....
Indianapolis From Hamilton, Ohio	20.93	20.93	....	....
South Bend, Ind. From Chicago	20.6935	20.6935	....	....
Milwaukee From Chicago	19.57	19.57	....	....
St. Paul From Duluth	20.94	....	....	....
Davenport, Iowa From Chicago	20.3832	20.3832	....	....
Kansas City From Granite City	21.2178	21.2178	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$23.50

GRAY FORGE PIG IRON

Valley furnace $18.00
Pittsburgh district furnace 18.00

CHARCOAL PIG IRON

Lake Superior furnace $21.00

Delivered Chicago 24.2528

Delivered Buffalo 24.57

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75.....$21.00
No. 2 fdy., sil. 1.75 to 2.75..... 20.50
Malleable 21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....$22.50
No. 2 fdy., sil. 1.75 to 2.25..... 22.00
Malleable 22.50
Basic 22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $85.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21% $26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads) $77.50
50% (ton lots) 85.00
75% (carloads 126.00
75% (ton lots) 136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads .....$1.35 to $1.45
Ferrotungsten, less carloads, 1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads ..... 10.00c.
Ferrochromium, 2% carbon .....16.50c. to 17.00c.
Ferrochromium, 1% carbon .....17.50c. to 18.00c.
Ferrochromium, 0.10% carbon .....19.50c. to 20.00c.
Ferrochromium, 0.06% carbon .....20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V. .....$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton $137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage 50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage 65.00
Ferromolybdenum, per lb. Mo., del. 95c.
Calcium molybdate, per lb. Mo., del. ..... 80c.
Silico spiegel, per ton, f.o.b. furnace, car lots $38.00
Ton lots or less per ton 45.50
Silico-manganese, gross ton, delivered:
2.50% carbon grade 90.00
2% carbon grade 95.00
1% carbon grade 105.00
Spot prices .....$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$11.25 to $11.75
No. 2 heavy melting steel	9.75 to 10.25
No. 2 railroad wrought	11.25 to 11.75
Scrap rails	11.50 to 12.00
Rails, 3 ft. and under	12.75 to 13.25
Compressed sheet steel	11.00 to 11.50
Hand bundled sheet steel	10.00 to 10.50
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	7.50 to 8.00
Short shov. turnings	7.50 to 8.00
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels	12.00 to 12.50
Heavy breakable cast	11.00 to 11.50
No. 1 cast	12.00 to 12.50
Railr. knuckles and couplers	14.00 to 14.50
Rail, coil and leaf springs	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Low phos. billet crops	14.75 to 15.25
Low phos. sheet bar crops	14.25 to 14.75
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.00 to 14.50
Steel car axles	14.25 to 14.75

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$9.50 to $10.00
Automobile hvy. melt. steel	9.00 to 9.50
Shoveling steel	9.50 to 10.00
Hydraulic comp. sheets	8.50 to 9.00
Drop forge flashings	7.50 to 8.00
No. 1 busheling	8.25 to 8.75
Rolled carwheels	10.50 to 11.00
Railroad tires	11.50 to 12.00
Railroad leaf springs	10.50 to 11.00
Axle turnings	9.00 to 9.50
Steel couplers and knuckles	11.00 to 11.50
Coil springs	12.00 to 12.50
Axle turnings (elec. fur.)	9.50 to 10.00
Low phos. punchings	12.50 to 13.00
Low phos. plates, 12 in. and under	12.50 to 13.00
Cast iron borings	5.00 to 5.50
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.50 to 5.00
Rerolling rails	11.00 to 11.50
Steel rails, less than 3 ft.	12.00 to 12.50
Steel rails, less than 2 ft.	12.50 to 13.00
Angle bars, steel	11.25 to 11.75
Cast iron carwheels	10.50 to 11.00
Railroad malleable	13.00 to 13.50
Agricultural malleable	9.50 to 10.00

	Per Net Ton
Iron car axles	$14.50 to $15.00
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	8.00 to 8.50
No. 2 railroad wrought	8.50 to 9.00
No. 2 busheling	4.50 to 5.00
Locomotive tires, smooth	10.00 to 10.50
Pipe and flues	5.00 to 5.50
No. 1 machinery cast	9.00 to 9.50
Clean automobile cast	8.50 to 9.00
No. 1 railroad cast	8.00 to 8.50
No. 1 agricultural cast	8.00 to 8.50
Stove plate	5.00 to 5.50
Grate bars	5.50 to 6.00
Brake shoes	6.00 to 6.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	*$9.50 to $10.00
No. 2 heavy melting steel	*8.50 to 9.00
No. 1 railroad wrought	10.00 to 10.50
Bundled sheets	9.50 to 10.00
Hydraulic compressed, new	9.00 to 9.50
Hydraulic compressed, old	6.50 to 7.00
Machine shop turnings	5.50 to 6.00
Heavy axle turnings	8.50 to 9.00
Cast borings	5.00 to 5.50
Stove plate (steel works)	8.00 to 8.25
Heavy breakable cast	10.00 to 10.50
No. 1 low phos. heavy	14.00 to 14.50
Couplers and knuckles	13.50 to 14.00
Rolled steel wheels	13.50 to 14.00
No. 1 blast furnace	4.75 to 5.00
Spec. iron and steel pipe	8.00 to 8.50
Shafting	17.00
Steel axles	16.00
No. 1 forge fire	9.50 to 10.00
Cast iron carwheels	11.00 to 11.50
No. 1 cast	11.00
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

* Brokers' buying price for export.

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$7.50 to $8.00
No. 2 heavy melting steel	6.00 to 6.50
Scrap rails for melting	7.50 to 8.00
Loose sheet clippings	4.00 to 4.50
Bundled sheets	5.50 to 6.00
Cast iron borings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
No. 1 busheling	5.50 to 6.00
No. 2 busheling	2.25 to 2.75
Rails for rolling	8.50 to 9.00
No. 1 locomotive tires	6.75 to 7.25
Short rails	11.00 to 11.50
Cast iron carwheels	7.50 to 8.00
No. 1 machinery cast	8.75 to 9.25
No. 1 railroad cast	8.00 to 8.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricultural malleable	7.50 to 8.00
Railroad malleable	8.50 to 9.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$9.75 to $10.25
No. 2 heavy melting steel	9.25 to 9.75
Compressed sheet steel	9.25 to 9.75
Light bundled sheet stampings	7.00 to 7.50
Drop forge flashings	8.00 to 8.50
Machine shop turnings	5.00 to 5.50
Short shoveling turnings	6.00 to 6.50
No. 1 busheling	8.50 to 9.00
Steel axle turnings	8.50 to 9.00
Low phos. billet crops	14.00 to 14.50
Cast iron borings	6.25 to 6.75
Mixed borings and short turnings	6.25 to 6.75
No. 2 busheling	6.25 to 6.75
No. 1 cast	11.50 to 12.00
Railroad grate bars	7.00 to 7.50
Stove plate	7.25 to 7.75
Rails under 3 ft.	14.00 to 14.50
Rails for rolling	15.50 to 18.00
Railroad malleable	13.00 to 13.50
Cast iron carwheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$10.00
No. 2 heavy melting scrap	8.50
Scrap rails	11.00
New hydraul. comp. sheets	8.50
Old hydraul. comp. sheets	7.50
Drop forge flashings	8.50
No. 1 busheling	$8.50 to 9.00
Hvy. steel axle turnings	8.00 to 8.50
Machine shop turnings	4.50 to 5.00
Knuckles and couplers	11.50 to 12.00
Coil and leaf springs	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Low phos. billet crops	12.00 to 12.50
Short shov. steel turnings	6.00 to 6.50
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
No. 2 busheling	6.50
Steel car axles	11.50 to 12.00
Iron axles	11.50 to 12.00
No. 1 machinery cast	11.00 to 11.50
No. 1 cupola cast	10.00 to 10.50
Stove plate	9.00 to 9.50
Steel rails, 3 ft. and under	12.50 to 13.00
Cast iron carwheels	11.00 to 11.50
Industrial malleable	12.00 to 13.00
Railroad malleable	12.00 to 13.00
Chemical borings	8.00 to 8.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	$8.50
No. 1 heavy melting steel	$5.25 to 6.00
*Scrap T rails	8.50
*No. 2 steel	7.50
No. 2 steel	5.00
Breakable cast	4.75 to 5.00
Machine shop turnings	1.50 to 1.75
Bundled skeleton, long	4.75 to 5.00
Forge flashing	4.75 to 5.50
Mixed borings and turnings	1.00 to 1.50
Shafting	12.00 to 12.50
Steel car axles	11.50 to 12.00
Cast iron borings, chemical	6.50 to 7.00
Stove plate	4.00 to 4.25

Per gross ton delivered consumers' yards:

Textile cast	$9.00 to $9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	*$7.00 to †$8.50
No. 2 heavy melting steel	*5.50 to †7.00
Heavy breakable cast	6.00 to 6.25
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	6.25
Stove plate	6.25
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	7.00 to 7.50
No. 1 yard wrought, long	6.00 to 6.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	8.50 to 9.00
Short shoveling turnings	1.75 to 2.00
Machine shop turnings	2.00 to 2.50
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.00 to 4.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.00
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	7.50

* For direct car loading only.
† Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$9.00 to $9.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	10.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$8.50 to $9.00
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	7.00 to 7.50
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	9.25 to 9.50
Railroad springs	9.50 to 10.00
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.00 to 8.50
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	10.00 to 10.50
Machine shop turnings	2.75 to 3.25
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	6.00 to 6.50
Steel rails less than 3 ft.	11.50 to 12.00
Steel angle bars	9.50 to 10.00
Cast iron carwheels	7.00 to 7.50
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	9.50 to 10.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$7.50 to $8.00
Borings and short turnings	4.00 to 4.50
Long turnings	$3.50 to $4.00
No. 1 machinery cast	10.25 to 10.75
Automotive cast	10.75 to 11.25
Hydraul. comp. sheets	7.50 to 8.00
Stove plate	6.50 to 7.00
New factory busheling	6.50 to 7.00
Old No. 2 busheling	3.75 to 4.25
Sheet clippings	4.50 to 5.00
Flashings	6.75 to 7.25
Low phos. plate scrap	7.50 to 8.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.00
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic, scheelite, delivered†	17.00

	Per Gross Ton
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

* Quotations nominal in absence of sales.
† Nominal; no supplies available.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	$13.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	16.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.85
Foundry, f.o.b. Connellsville Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.20 to 9.65
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	$8.35
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.05
Mine run coking coal, f.o.b. W. Pa.	2.05 to 2.25
Gas coal, ¾-in., f.o.b. Pa. mines	2.25 to 2.50
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.88c.
No. 5 industrial fuel oil	3.38c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	45.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	55.00
Silica clay, per net ton	8.00

Chrome Brick

	Per Net Ton
Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically Bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	42.50

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically Bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa.	$45.00
Domestic, f.o.b. Baltimore and Chester	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	65 per cent off list.
Machine bolts, 100 counts,	65 per cent off list.
Carriage bolts, 100 count,	65 per cent off list.
Nuts, all styles, 100 count,	65 per cent off list.
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap. or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	80
Cut point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	3.05
Cement c't'd nails, base per keg	3.05

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b., Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.26c.
Iron bars	3.26c.
Iron bars, swed, charcoal	6.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	4.31c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheet (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent
Machine bolts, cut thread:	Off List
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stocks	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.64c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.64c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	$3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill, size and quantity extras.

†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.45c.
Cold-finished bars	3.75c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.91
Com. wire nails, base per keg:	
1 to 24 kegs	3.50
25 to 50 kegs	3.30
Large quantities	3.10
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.16
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.37c.
Struc. shapes	3.25c.
Soft. steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.70c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb.	3.55

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.55c.
H beams and shapes	3.55c.
Plates—sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.35c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.60c.
Tire steel	4.60c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.30c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on order of 400 to 3499 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.60c.	3.55c.
Shapes, standard	3.55c.	3.60c.	3.55c.
Soft steel bars	3.60c.	3.60c.	3.60c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.70c.	3.75c.
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.
Cold finished steel:			
Rounds	5.95c.	5.85c.	6.00c.
Squares and hexagons	7.20c.	7.10c.	7.25c.
Flats	7.70c.	7.60c.	8.25c.
Common wire nails—base per keg less carload	$3.30	$3.40	$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Weekly Indications of Steel Activity

From THE IRON AGE

	Apr. 30, 1935	Apr. 23, 1935	Apr. 2, 1935	May 1, 1934	Average, Year to Date, 1935	1934
Steel ingot operations—Per cent of capacity	46.0	47.0	47.0	58.0	48.6	43.6

	Week Ended				Year to Date	
	Apr. 30, 1935	Apr. 23, 1935	Apr. 2, 1935	May 1, 1934	1935	1934
Fabricated structural steel awards	15,250	9,350	8,300	22,350	246,788	278,595
Fabricated plate awards	500	3,100	1,520	305	34,965	36,007
Sheet steel piling awards	0	8,050	350	0	11,965	18,670
Reinforcing bar awards	2,800	7,200	1,735	1,650	85,690	73,985

Lead Sellers Forecast April Sales Of 40,000 Tons; Prices Very Firm

April Copper Sales Total Only 24,000 Tons—Spelter Quiet But Price Basis Remains Firm—Tin Closes Slightly Higher

NEW YORK, April 30.—The automobile industry, copper's largest customer of recent months, is apparently well covered, and new demands for the red metal have therefore eased off to a considerable extent. Total bookings for the month amount to only about 24,000 tons, as compared to the normal book of 30,000 tons, which was exceeded by a considerable amount in March. The current market for electrolytic copper is spotty and generally very quiet, with Lake metal quoted at 9.12½c. a lb., delivered in the Connecticut valley, and electrolytic at 8.75c. at local refineries.

Foreign demands for this metal are again quite light, with the price in London holding steady at about 7.60c. a lb., delivered at usual Continental base ports. The market abroad has had to face a considerable amount of profit taking in the last two weeks, but all offers have been well absorbed.

Tin

This market has been featured by moderate day-to-day demands from all consuming lines, with nearby delivery specified in most cases. Quotations have been remarkably steady in London during the week. On first call today spot and future standard were quoted at £224 15s. and £219 10s. respectively, and Straits at Singapore at £229 17s. 6d. At New York, Straits metal was available this morning at 50.75c. a lb. Although domestic consumers are judged as not being any too well covered, they are nevertheless fighting the current higher prices.

Zinc

Most smelters are now comfortably booked and users, likewise, are generally well covered for nearby requirements. As a result, fresh trade in spelter is spotty and for small amounts from regular customers releasing on contracts. Sales last week amounted to about 1700 tons, of which the larger proportion was for nearby shipment. The price basis of this metal is firm at 4.45c. a lb., New York, and 4.10c., East St. Louis, and the statistical outlook is particularly encouraging on the basis of apparent consumption as against a reduced scale of output. The ore situation in the Tri-State area is not as healthy as is the condition of prime metal. Concentrate stocks now total 23,000 tons, which is practically equivalent to three weeks' output. Flotation and mill grades are currently available in good quantities at $25 and $26 a ton respectively; smelters entered the market during the week for about 8300 tons.

Lead

Consumer demands continue well distributed and in sufficient volume to enable principal smelters to dispose easily of daily ore intakes. It is estimated that April shipments will amount to between 40,000 and 45,000 tons, as compared with the usual 30,000 to 32,000 sold in previous months. This probable improvement in lead's statistical position and the steady purchases of consumers are both making for a firm price position, and it is probable that a general advance in quotations will be made in the near future.

Non-Ferrous Averages

The average prices of the major non-ferrous metals for April, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, N. Y.*‡	8.75c. a lb.
Lake copper, Eastern delivery*	9.12½c. a lb.
Straits tin, spot, N. Y.	50.045c. a lb.
Zinc, East St. Louis	4.03c. a lb.
Zinc, New York	4.38c. a lb.
Lead, St. Louis	3.54c. a lb.
Lead, New York	3.69c. a lb.

*Blue Eagle copper. ‡Price ¼c. higher in Connecticut Valley.

The Week's Prices. Cents Per Pound for Early Delivery

	April 24	April 25	April 26	April 27	April 29	April 30
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, spot, New York	50.75	50.62½	50.37½	....	50.25	50.75
Zinc, East St. Louis	4.10	4.10	4.10	4.10	4.10	4.10
Zinc, New York	4.45	4.45	4.45	4.45	4.45	4.45
Lead, St. Louis	3.60	3.60	3.60	3.60	3.60	3.60
Lead, New York	3.75	3.75	3.75	3.75	3.75	3.75

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel, electrolytic, 35c. to 36c. a lb. based at refinery in lots of 2 tons or more.
Antimony, 14.25c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	51.75c. to 52.75c.
Tin, bar	53.75c. to 54.75c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.25c.
*Seamless brass tubes	16.00c.
*Seamless copper tubes	16.25c.
*Brass rods	12.75c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.50c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

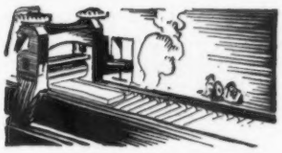
Tin, Straits pig	54.62½c.
Tin, bar	56.62½c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slabs	5.50c. to 5.75c.
Lead, American pig	4.50c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	56.50c.
Solder, ½ and ½	31.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.87½c.	6.62½c.
Copper, hvy. and wire	5.75c.	6.25c.
Copper, light and bottoms	4.75c.	5.25c.
Brass, heavy	3.12½c.	3.75c.
Brass, light	2.37½c.	3.12½c.
Hvy. machine composition	4.62½c.	5.12½c.
No. 1 yel. brass turnings	4.12½c.	4.62½c.
No. 1 red brass or compos. turnings	4.37½c.	4.87½c.
Lead, heavy	2.62½c.	3.00c.
Zinc	2.00c.	2.37½c.
Cast aluminum	10.12½c.	11.25c.
Sheet aluminum	11.50c.	13.00c.

Philadelphia Steel Users Continue to Buy Sparingly



Revisions Are Contemplated to Simplify Emergency Freight Charges—Export Scrap Purchases Are Heavy

PHILADELPHIA, April 30.—The stock positions of most steel users in this area are very low, and sellers are unable to develop any interest in the rebuilding of inventories to higher levels. The average consumer perceives little advantage in such action inasmuch as small lots of any grade can be secured almost over night from any of a number of mills and, in addition, the future status of the steel code is still uncertain.

Mills here continue to operate at substantially unchanged rates. Thus the district average remains at 32 per cent of capacity. The Pencoyd plant is currently operating three furnaces, and the 12-in. structural mill is operating on a full schedule. Several of the smaller mills are drawing on ingot supplies to some extent, but this action is temporary and will probably not result in the addition of extra furnaces over the next month.

The emergency freight charge of 7 per cent has so added to existing freight figures as to make them unwieldy; consequently sellers are quite enthusiastic over probable action of tariff agents of carriers to amend master emergency tariffs for finished steel in carload lots in order that the final freight figure will be in even cents or half cents. The effective date of this action will probably be May 1. Under this plan all rates up to and including 10c. will carry an emergency charge of ½c. per 100 lb., rates from 10c. to 20c. will have an emergency charge of 1c. per 100 lb., rates from 20c. to 28c. will carry 1½c. emergency charge per 100 lb., and all rates over 28c. will have a maximum emergency charge of 2c. per 100 lb.

Recent action of the Iron and Steel Institute has reduced the return to makers of tubular goods on sales conforming to Federal specifications. The extra charge of 2½ points has been eliminated, and outstanding quotations are now being revised to this lower price.

Pig Iron

Several sellers in this territory report April shipments as about 10 per cent heavier than those for March. This probably represents a borrowing of an equivalent tonnage from May, inasmuch as requirements for that month were prematurely released by a number of melters in order to escape prospective emergency freight charges. Neither Pennsylvania nor New Jersey has yet validated emergency charges for intrastate shipments; consequently local users have not yet been forced to pay higher tariffs. Iron consumers in this area continue to melt in greatly reduced volume, and forward prospects are so discouraging as to preclude any significant expansion of iron shipments over the remainder of the quarter.

Imports

The following iron and steel imports were received here last week: 4801 tons of chrome ore from Cuba, 2500 tons from Portuguese Africa, and 498 tons of the same product from British South Africa; 435 tons of pig iron from British India; 85 tons of steel tubes, 55 tons of steel bars, 4 tons of steel wire and 3 tons of steel forgings from Sweden, and 47 tons of structural shapes, 42 tons of diamond plates and 19 tons of steel bands from Belgium.

Sheets and Strip

Effective April 8, mills in this territory increased the jobbers' discount on Nos. 26, 28 and 29 gage galvanized roofing and siding sheets from $2 to $4 a ton. There is now concerted action on the part of jobbers to obtain a similar reduction on all classes of black and blue annealed sheets, with particular emphasis on black grades. No mill has yet shown any intention of taking such action. Local autobody stamping plants have just completed the most active month since the depression started. New purchases and shipments of full-finished material from other districts currently aggregate over 5000 tons weekly. Local radio builders recently purchased several cars of mixed grades of cold-rolled sheets and strip and hot-rolled pickled strip. Following the good demands for strip during January and February, this commodity is currently very quiet.

Bars, Plates and Shapes

With the exception of a small volume of routine buying, the reinforcing bar business is practically inactive. Only one large project is engaging local sellers, namely, 1100 tons for sewage work in the District of Columbia, on which bids have already been entered. Sellers of shapes likewise report that current demands are lighter than for any spring period for a number of years. This condition may be reversed to some extent in the late summer months if States in this area find it possible to borrow sufficient Federal funds to carry through highway programs already drafted. About 115 tons of shapes for a Fairmont, N. Y., school has been awarded to an unnamed interest, and the Belmont Iron Works will supply 350 tons for two northern New York projects. Bids were tendered this week covering 125 tons for a building for Campbell Soup Co., Camden, N. J., and of the few other active tonnages, not one aggregates over 250 tons. Plate sellers are experiencing slightly better miscellaneous demands, and there are a few larger tonnages in prospect. About 300 tons of plates and 100 tons of shapes will be required for a lightship to be built at Wilmington, Del. Baldwin Locomotive Works will soon purchase 165 tons for five locomotives and tanks to be built for the Mexican railways. Speddon Shipbuilding Co., Baltimore, intends to buy 100 tons of plates for building a tugboat, and bids are in on 5000 small oil tanks for Standard Oil of New Jersey, which will require 1400 tons of 3/16-in. plates.

Scrap

Export continues the dominant factor in this market. Dealers have about finished shipping old contracts of No. 1 at $9.75 to Port Richmond, and fresh purchases at the $9.50 level compare with export buying volume of a month ago. One boat is currently loading 5000 tons for Japan, and at least two additional full cargoes are expected to leave before May 12. Domestically, the market is stagnant, with nearby mills disinterested in rebuilding inventories of No. 1 at the $10 level. Recent small-lot transactions for local consumption have established railroad wrought, low phosphorous heavy and shafting 50c. a ton lower. Most other grades are untested and, therefore, are somewhat nominal as quoted.

Further Recession in Bookings at New York

Tin Plate Demand Is Sustained But Other Products Are Less Active—Large Projects to Come Up for Bids

NEW YORK, April 30.—Finished steel bookings, in the aggregate, have declined as compared with March, although volume in the lighter rolled products, notably tin plate, has undergone little change. Can companies will soon ask for shipments against tin plate ordered earlier in the year. According to present prospects they will place new orders just as fast as they issue releases against their "order plate," with the result that shipments will be exceedingly heavy during the remainder of this quarter. Since a very large part of the "order plate" has already been rolled and is now in mill storage, production will not be appreciably stimulated, though it will no doubt hold at close to present levels on the strength of new business.

Several large projects have moved closer to the contracting stage. The date for taking bids on the first lift span for the Triborough bridge, requiring 8000 tons of structural steel, has been set for May 16. On May 28 the Board of Transportation, New York, will receive tenders on 500 subway cars.

The Soviet Government recently issued an inquiry in this country for a round tonnage of sheets and strip steel, but its ideas of prices did not conform to those at which American mills were willing to sell.

Pig Iron

Furnace representatives here disposed of about 1500 tons in new commitments during the week, as compared with 1250 tons in the preceding period and 2600 tons booked two weeks earlier. The market continues very quiet, with selling made up of carlots for nearby shipment. Jobbing foundries in this immediate territory report a slight reduction in melting volume. Likewise in Connecticut, jobbing foundry activity has fallen off, but heavier foundries making machinery in that district have picked up to some extent and are currently moderately busy.

Scrap

The undertone of this market has improved considerably in sympathy with the firmer condition of the export situation and strengthening in the Pittsburgh market. Local brokers are releasing shipments to Italy following a lengthy delay due to exchange difficulties. Also, more Japanese boats will be available in the near future. Consequently local export brokers are more willing to take on additional foreign commitments. Brokers continue to secure truck lots of No. 1 and No. 2 steels alongside barges at $8.50 and $7 a ton respectively, although both of these prices have been bettered in particular cases where larger amounts or better materials have been involved. Unprepared yard iron and steel is now quotable at $4 and $4.50, and the higher level has been exceeded in several instances. The domestic market continues moderately active, with brokers paying $10.50 and $9 respectively for heavy breakable cast and No. 2 steel delivered into eastern Pennsylvania from this area.

Reinforcing Steel

Both bars and wire reinforcing continue in fair demand for small lots, but tonnage prospects are still scarce. A local warehouse will furnish 190 tons of bars for a grade crossing at Utica, N. Y., and 300 tons for the Bronx, N. Y., terminal market. Concrete Steel Co. will supply 125 tons for a United States Industrial Alcohol Co. building at Newark, N. J. The only project of importance now active calls for 1100 tons of bars for several sewage projects at Washington.

Sheet Demand Up In Southern Ohio

CINCINNATI, April 30.—Pig iron buying has receded slightly following the bulge preceding the effective date of the new freight rates. Bookings total about 700 tons, chiefly in 100-ton lots. Lack of price incentive is holding business in step with fluctuations of foundry melt. Reports of possible advances in quotations to offset freight rate changes are current. Foundry operations reflect slight improvement in machine tool business. Stove, automobile and household appliance foundries continue to operate at above the general average.

A seasonal spurt in galvanized sheet demand has lifted mill operations to slightly above 75 per cent of capacity. Automotive business continues to account for about one-third of total bookings. Ingot production is being maintained at between 70 to 75 per cent of capacity. The leading interest reports better than average operations at Middletown, with Butler slightly under the average. Other units, however, are on parity with the market trend. Freight rate changes have had little, if any, affect upon mill business. Prices are steady.

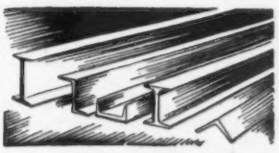
Prices on foundry grades of coke are unchanged, ovens outside Ohio absorbing recent freight advances. Movement of foundry grades of coke is good.

Scrap has a firmer tone. Refusal to take business at price reductions and the holding of yard supplies have tended to steady the market. Mill buying is at low ebb. Scrap on old commitments, however, is moving at the contract rate.

Detroit Scrap Prices Are Steadier

DETROIT, April 30.—Further signs of a stabilization of the local scrap market have become apparent in the past week. The trend of prices in the immediate future will be largely determined by bids developed on automobile lists scheduled to appear this week. The Chevrolet list is said to be one of the largest on record. Current activities are confined mostly to short covering by dealers. Water movement of scrap out of Detroit continues light.

Output Dips Four Points to 48 Per Cent at Cleveland



Labor Difficulties Impede Flow of Steel —Ore Prices Reaffirmed—Erie and Pere Marquette to Buy Rails Shortly

CLEVELAND, April 30.—New demand for finished steel is holding up well, although business in sheets and strip steel from automobile manufacturers has tapered off somewhat. Ingot output in the Cleveland-Lorain territory declined four points this week to 48 per cent of capacity. A local plant took off two open-hearth furnaces because of the suspension of operations by a strike of the Newton Steel Co., Monroe, Mich., which it supplies with sheet bars.

April bookings by steel sales offices in Cleveland equaled those in March despite some falling off in the last half of the month. Shipments of strip steel to some parts makers have been held up because of the shutting down of the Chevrolet transmission plant in Toledo by a strike. With this exception specifications from automobile parts makers continue in good volume and automobile manufacturers who are maintaining high production schedules are crowding parts makers for deliveries. Some slowing down in orders for parts is looked for in May.

The Pere Marquette railroad is in the market for 1100 tons of rails. The Erie railroad is expected to place orders against its 17,850-ton rail inquiry within two weeks. The Chesapeake & Ohio and Nickel Plate railroads have as yet made no announcements regarding their 1935 rail requirements.

Lake Superior ore prices have been reaffirmed for 1935 by the sale of substantial tonnages mostly to steel plants affiliated with the mining companies.

Pig Iron

Shipments have declined, and the total shipped in April in the Ohio and Michigan territories probably will be slightly less than in March. Automobile foundries are reducing their inventories, and there is less demand from that source. Some of these foundries, which recently carried a 30-day stock of iron, are reported to be bringing their inventories down to a seven-day supply. New business also has fallen off. A leading Lake furnace interest sold 2000 tons during the week in lots from carloads to 200 tons. The freight rate advance in Michigan on intrastate traffic becomes effective May 1, and this will be slightly helpful to furnaces in adjoining States, as they will have less freight to absorb when shipping into Michigan.

Sheets

New orders from automobile manufacturers have declined, but specifications from automobile parts makers in this territory are being well maintained and some new business has come from these plants. Stove manufacturers continue to order freely and some new business has come from barrel manufacturers. Orders from washing machine tub manufacturers have fallen off. The shut-down of the Newton Steel Co.'s mill in Monroe, Mich., because of labor trouble, has caused the shifting of some business to other mills by consumers needing early deliveries.

Iron Ore

Last season's Lake Superior ore prices have been reaffirmed for 1935 by sales of substantial lots by leading shippers. While most of the ore was purchased by affiliated consuming interests, some represented open market sales. This is the seventh year during which the same Lake ore prices have prevailed. Leading shippers have quoted last year's prices to the Ford Motor Co. against its recent inquiry for 180,000 tons, but none of the Ford business has as yet been placed.

While there was some talk of an advance to the amount of the increase of 11.2c. per gross ton in the freight rate, producers decided to absorb this advance. In the case of consumer-owned mines the advanced freight rate is, of course, borne by the consumer anyway. However, open market buyers who take only a small proportion of the ore will have an advantage in that the delivered price of their ore will be no more than before the freight advance. Reestablished ore prices per gross ton delivered lower Lake ports are: Old Range Bessemer, $4.80; Old Range non-Bessemer and Mesabi Bessemer, $4.65; Mesabi non-Bessemer, $4.50, and high phosphorus, $4.40.

Some increase is expected in the ore movement this year over 1934, when water shipments were 22,249,600 tons. Consumers who have covered for the season have made contracts for about the same quantities as last year. However, shipping schedules were cut sharply last summer. Estimates of a movement of from 28,000,000 to 29,000,000 tons this season are made by some ore shippers. While stocks at furnace yards and on docks will be about 2,000,000 tons less on May 1 than on the same date a year ago, or a reduction of from 26,580,000 to approximately 24,600,000 tons, ore stocks are still far above normal.

An early start was made in ore shipments this year, the movement during April being estimated at about 250,000 tons. Last year no ore was shipped until May. Two or three cargoes were consigned to lower Lake ports in time to escape the new freight rate surcharge.

Strip Steel

Releases continue fair from automobile companies and parts makers, but there is not much new business. Some of the cold rolling plants are maintaining recent operations, but are cutting into their backlog.

Bars, Plates and Shapes

Forge shops continue to order bars in good volume for automobile parts, and miscellaneous demand is well maintained. Demand for structural shapes in small lots for private building work has gained. An Ohio fabricator has taken 1365 tons for bridge work in connection with the Wheeler dam TVA project. An award of 588 tons of reinforcing bars for the Beach City, Ohio, dam, a part of the Muskingum district conservation project for which bids were taken 10 days ago, has not yet been made. Bids will be opened in Washington tomorrow for a Cleveland housing project, requiring 1037 tons of bars. Demand for plates is rather slow.

Scrap

Following the recent consumer purchases new demand has disappeared, and about the only activity is the covering by dealers against their recent $10-a-ton orders for

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P&H HANSEN ARC WELDERS

No. 2 heavy melting steel for delivery to a Youngstown mill. Prices are unchanged. While producers are disposing of scrap at recent quotations, dealers are not willing to sell much scrap from their yard stocks at present prices. Three of the General Motors units have issued scrap lists for May aggregating 3000 tons or more, and new scrap lists have been issued by the Chesapeake & Ohio, New York Central and Erie railroads.

Implement Demand Holds at St. Louis

ST. LOUIS, April 30.—The demand for farm implements in virtually all sections of the eighth Federal Reserve District continues in larger volume than at any similar period during the last five years, according to the report of the Federal Reserve Bank of St. Louis. "Sales of tractors are especially outstanding, this form of power having invaded sections where it was little in evidence during preceding seasons," the report continues. This condition has made for a much heavier consumption of pig iron by manufacturers in this territory. Other helpful factors are a marked increase in the demand for washing machines, and a higher production than usual of gas ranges by the stove plants in the district. Since April 18, there has been a recession in pig iron shipments.

Warehouse business is about on a parity with March. Operations of the steel fabricating plants in the St. Louis district average about 25 per cent of capacity, with two plants working at about 50 per cent of capacity.

The scrap market continues very quiet. Offerings are light. Dealers say that there is not very much to look forward to for at least 30 days, unless outside markets get stronger. Prices are unchanged.

Pig Iron Demand Rises in South

BIRMINGHAM, April 30.—Preliminary figures from merchant pig iron producers indicate April shipments surpassed those of March, thus registering an increase for the fourth consecutive month.

Business in prospect indicates there will be a further increase in shipments during May. This gain is predicted by producers despite the fact that considerable business in April was driven in by the increase in freight rates. Four blast furnaces were operated on mer-

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P&H HANSEN ARC WELDERS

chant iron during the past month, and operations will probably remain on an unchanged basis in May, although two additional furnaces are being prepared for possible heavier demands.

Steel production schedules will be continued at the present rate for the next two or three weeks, at least. Twelve open-hearth furnaces are active in the Birmingham district, and to supply these furnaces, five blast furnaces are producing basic iron. With structural steel demand still far from satisfactory, producers here are looking toward the new work relief program to take up the slack that will result when present rail requirements have been filled. The demand for lighter shapes continues good.

Cast iron pressure pipe business continues spotty and uncertain, though in the aggregate orders have been sufficient to maintain production in the district around 40 to 50 per cent.

Scrap Exports From Boston Heavier

BOSTON, April 30.—The export scrap market has taken a new lease on life. A steamer with 7200 tons of scrap cleared for Genoa, Italy, last week, another boat with 2550 tons of No. 2 steel, scrap rails, pipe and engine blocks sailed for Gdynia, Poland, and a third boat with 204 tons of scrap brake shoes, 34,275 steel tubes, 223,760 carwheels and 56,370 pieces of tin plate scrap for Japan. Two steamers have been chartered to load this week, one for a Danubian port, at $3.35 a ton freight, and the second for a United Kingdom port. For No. 1 steel, of which the supply is light, exporters pay $8.50 a ton, delivered army base, and for No. 2 steel, $7.50.

Low prices offered by Pennsylvania consumers, plus increased freight rates, have practically eliminated shipments, although a few car lots of steel turnings, at $1.50 to $1.75 a ton, f.o.b., were moved to the Pittsburgh district the past week. Little steel scrap is going to Worcester.

Large New England pig iron consumers are sufficiently stocked to carry them up to or beyond June 30. Consequently current sales are in driblets, with Dutch iron dominating the situation. Buffalo furnaces and others outside New England are now under the new freight schedules, which mean a larger absorption of differentials to meet Mystic, Indian and Dutch iron prices.

Warehouses have made a general small advance in prices on a majority of items handled by them.

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King Would Abolish NRA

SENATOR KING, Democrat, Utah, introduced a bill in the Senate Monday to abolish NRA and to transfer codes to the Federal Trade Commission. The transfer would be made as soon as NRA expires on June 16.

Republic Orders New Mill

UNITED ENGINEERING & FOUNDRY CO., Pittsburgh, has been awarded a contract by Republic Steel Corpn., Youngstown, Ohio, for a 42-in. cold reversing mill to be installed at Republic's Warren, Ohio, plant for the production of black plate for tinning. This mill, which will be built at United's Youngstown works, is the second of this type to be ordered by Republic from United.

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1. Bench or floor types, all motor driven.
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Fabricated Structural Steel

Lettings in Fair Volume—New Projects Decline

MORE than one-half of the week's structural steel awards, totaling 15,250 tons, are accounted for by a Mississippi River dam at Alton, Ill., taking 7700 tons, and by requirements of 1650 tons for the Wheeler Dam in Tennessee. Other bookings are in small tonnages. New projects of 6850 tons compare with 12,250 tons last week and 5700 tons two weeks ago. The only new job of size is 1600 tons for a high school at New Dorp, Staten Island. Plate awards call for only 500 tons, with more than 7300 tons pending. Structural steel contracts in April totaled 60,275 tons compared with 79,150 tons in March and 46,105 tons in February. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

East Walpole, Mass., 200 tons, plant extension, to New England Structural Co.

East Boston, 300 tons, grandstand, etc., to Lehigh Structural Steel Co.

Auburn, Mass., 125 tons, high school, to an unnamed fabricator.

Wilson, N. Y., 100 tons, school, to Buffalo Structural Steel Corpn.

Tonawanda, N. Y., 100 tons, addition for Buffalo Steel Co., to R. S. McMannus Steel Corpn.

Fairmont, N. Y., 115 tons, school, to an unnamed fabricator.

Utica, N. Y., 220 tons, Broadacres Sanatorium, to Belmont Iron Works.

New York, 115 tons, Bronx Terminal Markets, to George A. Just Co.

New York, 325 tons, Farmers Sheds Bronx Market, to George A. Just Co.

New York, 285 tons, post office station "Y", East Seventieth Street, to Lehigh Structural Steel Co.

Queens, N. Y., 310 tons, St. Margaret's School, Middle Village, to Berkshire Structural Steel Co.

Passaic County, N. J. 140 tons, New Jersey State highway bridge, route 23-6, Section 14, to American Bridge Co.

Hagerstown, Md., 140 tons, post office, to Maryland Steel Products Co.

Baltimore, 110 tons, building for Crown Cork & Seal Co., to Ingalls Iron Works.

Baltimore, 275 tons, building for Levenson & Klein, to Dietrich Brothers.

THE SOUTH

Wheeler Dam, Tenn., 1650 tons, roadway bridge; 1380 tons to Mount Vernon Bridge Co. and 270 tons to Duffin Iron Works.

Nashville, Tenn., 585 tons, S. H. Kress store, to Ingalls Iron Works.

Angelina-Trinity County, Tex., 270 tons, bridge NRS-776D, to Austin Brothers Bridge Co.

Comal County, Tex., 415 tons, bridge NRS 780-B, to Pittsburgh-Des Moines Steel Co.

CENTRAL STATES

Wayne County, Ind., 120 tons, State highway bridge 1057 to Pan-American Bridge Co.

Alton, Ill., 7700 tons, Dam No. 26, Mississippi River, to American Bridge Co.

Chicago, 235 tons, building for In-tag Co., to Joseph T. Ryerson & Son.

Springfield, Ill., 180 tons, alterations to International Harvester Co. plant, to Burger Mfg. Co.

Macoupin, Ill., 250 tons, bridge, to Clinton Bridge Co.

Willmar, Minn., 165 tons, auditorium, to Minneapolis Moline Power & Implement Co.

Waterloo, Iowa, 200 tons, John Deere building, to Gage Structural Steel Co.

State of Iowa, 175 tons, bridge, to Pittsburgh-Des Moines Steel Co.

WESTERN STATES

Boulder City, Nev., 270 tons, control cable supports, to an unnamed bidder.

Long Beach, Cal., 107 tons, Burnett school, to Pacific Coast Steel Corpn.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Mexico, Maine, 100 tons, school.

New Dorp, Staten Island, 1600 tons, high school; bids to be taken by Department of Education, New York, May 16.

New York, 8500 tons, contract No. 37, Harlem River crossing, Tri-Borough bridge; bids May 16.

Queens, N. Y., 500 tons, incinerator building.

Baltimore & Ohio Railroad, 255 tons, Main Street subway at Le Roy, Pa.

Camden, N. J., 125 tons, building for Campbell Soup Co.; bids in.

THE SOUTH

Park View, W. Va., 500 tons, slide gates for Tygart River dam.

Wichita Falls, Tex., 425 tons, bridge.

Houston, Tex., 200 tons, garage.

CENTRAL STATES

Zanesville, Ohio, 250 tons, building for Hazel-Atlas Glass Co.

Lawrence, Ind., 450 tons, bridge.

Moline, Ill., 250 tons, building.

State of Illinois, 500 tons, bridges.

La Crosse, Wis., 200 tons, power plant.

North Platte, Neb., 250 tons, power house.

WESTERN STATES

South San Francisco, 425 tons, Southern Pacific Co. subway; bids under advisement and award not made to American Bridge Co. as previously reported.

Delano, Cal., 132 tons, Southern Pacific Co. subway; bids under advisement and award not made to American Bridge Co. as previously reported.

Sacramento, Cal., 295 tons, Montgomery-Ward building; bids open.

Los Angeles, 710 tons, warehouse for California Walnut Growers Association; bids under advisement.

Los Angeles, 482 tons, revised plans for San Gabriel Dam No. 1; material to be purchased within one year.

Bonneville, Ore., 450 tons, bridge.

FABRICATED PLATE

AWARDS

Baltimore, 250 tons, 15 tanks for U. S. Industrial Alcohol Co., to Ingalls Iron Works Co.

Campbellsport, Wis., 150 tons, elevated water tank, to Chicago Bridge & Iron Works.

Torrance, Cal., 100 tons, city tank, to Chicago Bridge & Iron Works.

NEW PROJECTS

Boston Metropolitan District, 780 tons 48-in. pipe; bids close May 16.

Newark, N. J., 1400 tons, 5000 small oil tanks for Standard Oil Co. of New Jersey; general contract bids in.

Philadelphia, 165 tons, plates for five locomotives being built by Baldwin Locomotive Works.

Hays, Pa., 3000 tons, preliminary plans for barges and tanks, for American Oil Co., Baltimore.

Princeton, Wis., 125 tons, elevated water tank; Pittsburgh-Des Moines Steel Co., low bidder.

Los Angeles, 1850 tons, penstocks for San Gabriel dam No. 1; material to be purchased within one year.

SHEET PILING

NEW PROJECTS

Monroe, La., 1700 tons, sea wall; bids May 1 by United States Engineer Office at Vicksburg, Miss.

San Francisco, 156 tons, for Naval Purchasing Agent; bids under advisement.

Chicago Iron and Steel Market

(CONTINUED FROM PAGE 65)

blocking the placing of the Ashland Avenue, Chicago, bridge.

Rails

The Chicago & Eastern Illinois has ordered 2500 tons of rails and about 500 tons of tie plates. Accessory purchases by other railroads are very light. Active inquiries are lacking, though it is expected that the Erie will soon place its order. Shipping orders received in recent days have helped mill schedules. Shipments of light rails are dropping as warm weather forces cuts in coal mining operations.

Scrap

Brokers are still pressing for higher prices, but have not yet broken through the resistance of the larger consumers. However, on trades between brokers and in dealings with producers higher prices are the rule. Railroads have recently received close to $11 a gross ton, delivered, for heavy melting steel, and factory bundles acceptable for steel foundry use have moved at a new high for delivery north of Chicago. Dealers now feel that they cracked the market to too low a point, for they restricted supplies and they are now trying to stimulate a flow of material in the face of uncertain mill operations and mill stocks that are not large but ample under present conditions.

Hearing on Ohio Intrastate Rates

A HEARING on the proposed freight rate advance on intrastate traffic in Ohio will be held in Columbus, May 13, under the direction of the Interstate Commerce Commission.

Recently the Public Utilities Commission of Ohio refused to grant on short notice advances in intrastate rates to correspond with the interstate rate advances authorized by the Interstate Commerce Commission. Since that ruling the Ohio railroads have not filed new rates with the State Public Utilities Commission and appear to have concluded that a shorter cut to settle the proposed advance on State rates would be to have the matter handled directly by the Interstate Commerce Commission.

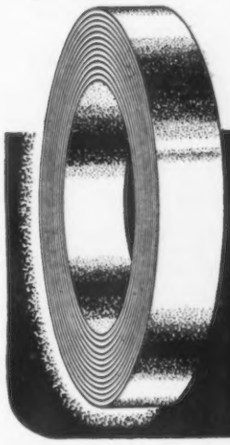
Some delay is expected after the hearing before the commission announces decision on the Ohio rate case and in the meantime the existing rates will remain in effect.

THE ADVANTAGE OF

Specialized Production

Outstanding progress and an enviable quality reputation of years standing gives convincing evidence of the better service and better product resulting from specialized production of cold rolled strip steel by Thomas . . . Exclusive attention and concentration of all facilities on the proper specification, exacting manufacture and dependable delivery of strip steel, most adequately meets each individual customer's requirements . . . This specialized Thomas experience and time-proven service has made Thomastrip the preferred specification of the most particular fabricators . . . A Thomas representative will gladly cooperate with you.

Test Thomastrip for your product. Send for test samples. Specify gauge, width, temper and coat desired.



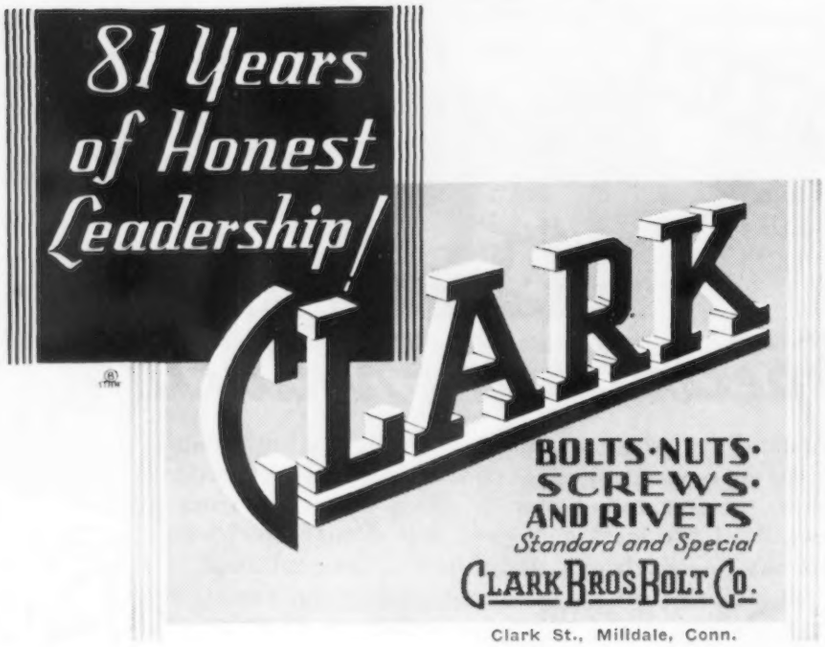
THE THOMAS STEEL CO. · WARREN, O.
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

THOMASTRIP
STRIP COLD ROLLED STEEL
BRIGHT FINISH · ZINC COATED
COPPER COATED · CADMIUM COATED

TRADE NOTES

Lubrication Products Co., Cleveland, is removing its offices to 1400 West Twenty-fifth Street, additional space required by increases in business is available, effective May 4.

Carter, Milchman & Frank, Inc., 139 Spring Street, New York, is now distributer in New York territory for stock gears, sprockets and speed reducers manufactured by Charles Bond Co., Philadelphia, and also for power transmitting specialties, hangers, couplings, pillow blocks and truck casters made by Bond Foundry & Machine Co., Manheim, Pa.



Cast Iron Pipe

Wolfeboro, N. H., has awarded 22,000 ft. of 8-in. and 650 ft. of 6-in. to Central Foundry Co.

Fall River, Mass., has taken bids on 2340 ft. of 6 to 12-in.

Aurora, Ill., 1100 tons; Nicholas Santucci is low bidder on general contract.

Princeton, Wis., has low bid from James B. Clow & Sons on 150 tons of 6 and 8-in. water pipe.

Campbellsport, Wis., has placed 200 tons with American Cast Iron Pipe Co.

Mountain Home, Idaho, has placed 457 tons of 4 to 8-in. with Water Works Equipment Co.

Tremonton, Utah, has awarded 118 tons to an unnamed bidder.

Spokane, Wash., has taken bids on 140 tons of 12-in.

San Francisco will take bids May 3 on 345 tons of cast iron fittings.

Emeryton, Utah, has taken bids on 235 tons of 2 to 6-in.

Orangeville, Utah, has opened bids on 100 tons of 2, 3 and 4-in.

Los Angeles has received bids on 5150 tons, for which United States Pipe & Foundry is low bidder on 3700 tons, National Cast Iron Pipe Co. is low on 700 tons and American Cast Iron Pipe Co. low on 750 tons.

Inglewood, Cal., will take bids May 6 on 157 to 179 tons of 4 to 8-in.

Carson Water Co., Carson City, Nev., plans quantity of 12-in. for replacement of number of main trunk lines. Fund of $30,000 has been autnorized.

Hurricane, W. Va., closes bids May 7 for pipe lines for water supply and other waterworks equipment. J. E. Settle, Charleston National Bank Building, Charleston, W. Va., is consulting engineer.

Russell, Kan., asks bids until May 15 for pipe lines for water system; also for elevated steel tank and tower, reservoir and other waterworks construction. Cost about $120,000. Black & Veatch, 4706 Broadway, Kansas City, are consulting engineers.

Plattsburg, N. Y., plans pipe lines for water supply; also other waterworks equipment. Fund of $42,000 has been arranged. Bids will be asked soon.

Cumberland, Ky., plans pipe lines for water supply; also other waterworks construction. Fund of $97,000 has been secured through Federal aid.

Riverside, Cal., plans about 34,000 ft., various sizes, for pipe lines for water supply, replacing present pipe. Fund of $65,800 is being arranged.

Dawson, Tex., plans pipe lines for water supply; also pumping machinery and other waterworks equipment. A. F. Mitchell, Corsicana, Tex., is consulting engineer.

Barrington, R. I., plans pipe lines for water supply; also other waterworks construction. Fund of $125,000 is being arranged through Federal aid.

Hackleburg, Ala., plans pipe lines for water supply; also other waterworks equipment. Fund of $30,000 has been secured through Federal aid.

Blanchester, Ohio, closes bids May 9 for pipe lines for water supply; also for other waterworks equipment. Fund of $38,000 has been arranged. Jennings & Lawrence, 12 North Third Street, Columbus, Ohio, are consulting engineers.

Topsfield, Mass., plans pipe lines for water supply; also for other waterworks equipment. Appropriation of $100,000 is being arranged. J. F. Morissey is head of committee in charge.

Longview, Tex., plans pipe line to Big Sandy Creek district, about 30 miles, for new source of water supply. Also pipe lines for distribution system and other waterworks construction. Cost about $400,000. B. N. Taylor, city manager, is in charge.

Poth, Tex., plans pipe lines for water system. Fund of $26,000 has been authorized for this and other waterworks construction. A. R. Ririe, 655 East Woodlawn Avenue, San Antonio, Tex., is consulting engineer.

Lebanon, Va., plans about 19,700 ft. 6-in.; also other waterworks improvements. Appropriation of $20,000 is being arranged.

Osceola, Ark., plans pipe lines for water supply; also other waterworks extensions. Fund of $39,000 is being arranged.

Pipe Lines

Sentry Oil Co., Craig, Colo., plans extensions in welded steel pipe line system for crude oil service. Application has been made to Craig City Council for permission to build certain part of line in municipality.

Clinton, La., plans steel pipe line system for commercial gas supply. F. P. Joseph, Glenmora, La., consulting engineer, has been engaged to prepare plans and specifications.

Phillips Petroleum Co., Bartlesville, Okla., has authorized about 12,000 ft. 16-in. welded steel pipe line for gas service in Phillips Avenue. A. H. Riney is engineer in charge.

Albert Kalo, care of City Clerk, Lebanon, Ky., and associates have secured local franchise for natural gas supply, and plan early installation of steel pipe line system for this service. Company is being organized with capital of $100,000 to carry out project.

United States Engineer Office, Jacksonville, Fla., closes bids May 3 for ten lengths, each 40 ft. long, 12-in. special steel machine electric resistance welded black steel pontoon discharge pipe (Circular 894).

Carbondale, Colo., has let contract to Page-Claybaugh Engineering Corpn., Grand Junction, Colo., for 8-in. welded steel pipe line, about 16,478 ft., for main water supply line. Also for 14,990 ft. 6-in. cast iron pipe line for distribution system. Cost about $40,000. S. Q. Horn, 1465 Fillmore Street, Denver, Colo., is consulting engineer.

Grant, Mich., is considering steel pipe line system for natural gas supply, including main line connection with Mecosta-Muskegon pipe line of Muskegon Gas Co., Muskegon, Mich., which will furnish bulk service, and distribution system.

Dayton, Ore., 280 tons, 6 and 8-in. steel pipe, to Pacific Water Works Supply Co.

Building Demand Rises On Coast

SAN FRANCISCO, April 29.—Steel demand has improved, gains in reinforcing bar movement in southern California being outstanding. School alterations and construction in the vicinity of Los Angeles account for 1161 tons of the 3243 tons of bars awarded during the week. Blue Diamond Corpn. booked 1285 tons for five jobs, while Concrete Engineering Co. took 975 tons. New projects involving reinforcing bars have also been greater than for any week of the present quarter. Structural awards total 1141 tons. The booking of 500 tons by Consolidated Steel Corpn. was outstanding.

Revised plans for San Gabriel dam No. 1 call for the additional purchase of 1850 tons of plate for

penstocks, 750 tons of reinforcing bars and 482 tons of structural steel for gates and trash racks. The Los Angeles Department of Water and Power has opened bids on 5150 tons of cast iron pipe and it is reported that United States Pipe & Foundry Co. is low on 3700 tons, while National Cast Iron Pipe Co. and American Cast Iron Pipe Co. are low on the balance of 1450 tons.

Pending projects in the San Francisco area on which general contracts have been let call for a total of 4421 tons of reinforcing bars and 3516 tons of structural steel. Outstanding is the Trans-Bay bridge distribution structure, which will require 3033 tons of bars, 2800 tons of shapes and 330 tons of pipe railing. Contrary to reports the Southern Pacific company has not yet placed 558 tons of structural steel for underpasses at South San Francisco and Delano, Cal. A building for Montgomery Ward & Co. at Sacramento, Cal., calls for 295 tons of shapes and joists and 124 tons of bars.

Steel Output Off At Buffalo

BUFFALO, April 30.—The Lackawanna plant of the Bethlehem Steel Corpn. has reduced the number of its active open-hearth furnaces from eight to six. The plant had been operating nine up to late last week when one furnace was taken out, making eight active. Further curtailment was decided upon Friday for this week's schedule. Republic is operating three furnaces and Wickwire-Spencer Corpn. one. The Seneca sheet division of Bethlehem is operating at about 60 per cent, the lowest rate in several weeks.

Placing of fabricated structural steel in small tonnages shows a noticeable increase. Two Buffalo fabricators have taken contracts for more sizable tonnages—one for a school in Wilson, N. Y., and the other for an addition to the plant of the Buffalo Steel Co. in Tonawanda. Each contract amounted to approximately 100 tons.

Buffalo scrap dealers are buying scrap and laying it down, being of the opinion that some sort of inflation will ensue within the next six months. The principal consuming interest reduced its offering price to $9.50 for No. 1 heavy melting steel, but this figure was only in effect a few days, when the same mill increased its offers to $10. This policy was induced in part by the increase in freight rates and switching charges. The switching charge is 10 per cent higher, and the entire increase, dealers report, makes a difference of between 20c. and 35c. on unfinished scrap. Considerable scrap from central New York is again being exported. Boat shipments are being regularly received at Buffalo mills.

Pig iron business is quiet, though foundry melt is reported as fairly steady and the demand for shipments consistently good.

A machine for external grinding? Or one for internal grinding? Neither you say. But you do have a great variety of parts to external grind and still others to internal grind. Altogether only sufficient to keep one machine busy.

Great. You're the man we are looking for. The Landis 14" Type C Plain Hydraulic is the grinder you are looking for. Being a Universal it is equally suitable for a wide range of internal and external operations. Changing from an internal to an external set-up or vice-versa requires less time than on any similar machine we know of. Ample weight and wide speed ranges combine to produce work rapidly.

May we suggest as a first step the sending for catalog No. L-33. 176

LANDIS TOOL CO.
WAYNESBORO, PA.

Record Scrap Exports In March

FEATURED by a record scrap movement of 228,338 gross tons, March exports of iron and steel aggregated 323,035 tons. Of the scrap shipments, 160,475 tons went to Japan. The preceding peak export movement of scrap was in November of last year, with a total of 216,566 tons.

A *New* DAVIS KEYSEATER
Tilting Table Type

The outstanding feature of this new machine is the tilting table which may be set at any angle required for cutting straight or tapered keyways in bores tapering up to 3″ per foot.

The cutter remains vertical at all stages of the operation, making it easy to set up the work.

The table is hand fed by a lever at the front, an adjustable stop being provided to limit the depth of cut.

The same broach type cutters are used as in the older machines of fixed table type.

Built in three sizes to cut keyways from 1/16″ to 1½″ in width. Send for circular giving complete details.

DAVIS KEYSEATER COMPANY

400 Exchange Street ROCHESTER, NEW YORK

PERSONALS

(CONTINUED FROM PAGE 59)

treasurer is T. A. HARPER, Edgar T. Ward's Sons' Co. J. M. HILBISCH, Jones & Laughlin Steel Corpn., will represent this chapter on the national board of directors.

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HOWARD I. YOUNG, president, American Zinc, Lead & Smelting Co., St. Louis, was elected president of the American Zinc Institute at the Institute's annual convention, held in Statler Hotel, St. Louis, April 22 and 23. He succeeds RALPH M. ROOSEVELT, of New York, who had been president for seven consecutive years. Other officers were elected as follows: Vice-presidents, C. A. CHAPIN, JR., New York; JOHN A. ROBINSON, Miami, Okla., and JAMES O. ELTON, Salt Lake City; treasurer, JAMES A. CASSELTON, St. Louis, and secretary, E. V. GENT, New York.

❖ ❖ ❖

PAUL R. SPENCER has been appointed sales representative with headquarters at 4000 York Street, Denver, Colo., for the La Salle Steel Co., Chicago. He will handle the distribution of the company's cold-finished carbon and cold-finished alloy steel bars in the states of Colorado, New Mexico, Arizona, Nevada, Idaho, Montana, Wyoming, western Nebraska and western Texas.

R. M. THAXTON has been appointed exclusive valve representative for the Homestead Valve Mfg. Co., Coraopolis, Pa., in sixteen counties comprising the southeastern section of New York State.

❖ ❖ ❖

JOSEPH C. JONES has become associated with Sanderson & Porter, engineers, at 52 William Street, New York. Mr. Jones was with Ford, Bacon & Davis, Inc., until March 1, and formerly with Thomas E. Murray, Inc., in both cases engaged in furthering their activities in connection with industrial and public utilities works, and will be similarly engaged with Sanderson & Porter.

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J. K. B. HARE has been appointed manager of the Buffalo office of the Westinghouse Electric & Mfg. Co. to fill the vacancy caused by the appointment of H. F. BOE as assistant manager of the Eastern district, with headquarters at New York. Mr. Hare has been with the Westinghouse company since 1916, having previously been associated with the Westinghouse Air Brake Co. He first was employed as an engineering and sales representative in the Atlanta office, and after serving in the World War he returned to the Westinghouse Pittsburgh office in 1919. Since then he has been manager of the Columbus, Ohio, office and assistant central station manager of the company, with headquarters at New York. Prior to his transfer to the Buffalo office, he was central station and transportation sales manager of the central sales district, whose headquarters are at Pittsburgh.

❖ ❖ ❖

WILLIAM K. NORRIS, president, McQuay-Norris Mfg. Co., St. Louis, maker of piston rings, has been appointed chairman of the Industrial Advisory Committee for the Eighth Federal Reserve District, which considers granting of loans to provide working capital for established industrial or commercial businesses, in accordance with Section 13 (b) of the Federal Reserve Act.

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A. J. O'LEARY has been appointed assistant to the general manager of sales at Lukens Steel Co., Coatesville, Pa. Prior to joining the Lukens organization in 1916, he was with the Pennsylvania Railroad and Alan Wood Steel Co. He spent five years in the mills and mill service departments at Lukens before he was transferred to the sales department, where he has served since 1931.

❖ ❖ ❖

NORMAN F. SMITH has been made secretary and treasurer of the Osborn Mfg. Co., Cleveland. He became associated with the company after his graduation from Dartmouth College in 1925 and later was transferred to New York as vice-president and manager of Rubico Brush Manufacturers, Inc., an Osborn subsidiary. He is the son of FRANKLIN G. SMITH, president of the Osborn company.

OBITUARY

HARRY E. ROGERS, vice-president of the Excelsior Foundry Co., Belleville, Ill., died at the home of his parents there on April 26, after an illness of more than a year. He was 51 years old. He served as a captain in the Motor Transport Corps during the World War.

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PATRICK J. MOOHAN, works manager, Nash Motor Co., Kenosha, Wis., since establishment of the company in 1916, died April 25, aged 56 years. He was born in Canada, going to Detroit as a boy. He learned the machinist trade and was employed by the Arthur Kolton Co., working with Henry Ford in the development of the famous "999" racing car. Later he went to the Cadillac plant. In 1909 he became works manager of the Buick Motor Co. at Flint, and when Charles W. Nash retired from Buick and General Motors Corpn.,

to set up his own motor car factory in Kenosha, he chose Mr. Moohan as works manager. He was prominent in civic affairs of Kenosha.

❖ ❖ ❖

CHARLES A. STOCKSTROM, chairman of the board of the American Stove Co., St. Louis, died on April 25 at Mount Clemens, Mich. He was born in Germany 83 years ago, and came to this country when 16 years old. In 1881, he and his brother, Louis Stockstrom, organized the Quick Meal Stove Co., St. Louis. In 1902, the two brothers organized the American Stove Co. He served as president of the two companies for 25 years, being succeeded by Louis Stockstrom, now president of the company.

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WILLIAM H. FRENCH, who since 1919 had been assistant to the vice-president, Carnegie Steel Co., Pittsburgh, died at Pittsburgh on April 29. He was born on June 8, 1872, at New Haven, Conn. He studied law at Yale University, later working as a newspaper reporter in various New England cities, and in 1902 he joined the

W. H. FRENCH

Associated Press as editor for New England at the Boston office. Later he was transferred to the New York office as general editor and confidential representative to Melville E. Stone. Subsequently he served as a political writer at the Washington office, and then returned to New York in the same capacity. In January, 1906, he was transferred to Pittsburgh as manager of the Associated Press branch, covering Western Pennsylvania, Eastern Ohio and West Virginia, and served in that capacity until he joined Carnegie Steel Co. in 1919.

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CHARLES AUGUST PAESCHKE, president of Geuder, Paeschke & Frey Co., Milwaukee, died April 28 at his home in Milwaukee. He was one of the founders in 1880 of the company which he headed for so many years. The golden anniversary of his connection with this manufacturing business was celebrated on Jan. 7, 1930. Mr. Paeschke was born in Milwaukee in 1857.

ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

A complete line of Chrome-Vanadium Tool Steel Sockets. Wrenches and Sets for every industrial and automotive use.

Large Size Wrenches

Steel Socket Reversible Ratchet Bridge Wrenches, steel throughout with wearing parts hardened, wide open spindles that allow bolts to pass through them. Lengths from 24 to 48 inches. Socket from 1" to 5" openings.

Sockets, Wrenches Sockets and Sets

Come with both Double Square (8 point) and Double Hexagon (12 point) openings for "Light" and "Standard" drives, and in Standard (tapered), Extra Deep, Straight Wall, Extra Heavy and Extra Deep types. Ratchets are drop forged from special Steel, carefully heat treated to maximum strength. Design improvements include: Elimination of knobs and projections, better balance and the ARMSTRONG exclusive Drivelock feature—prevents sockets from falling off.

Write for Catalog B-35

ARMSTRONG BROS. TOOL Co.
"The Tool Holder People"
309 N. Francisco Ave.,
CHICAGO, U. S. A.

Reinforcing Steel

Awards 2800 Tons—New Projects 2150 Tons

AWARDS

Los Angeles, 417 tons, tunnel at Ocean and Colorado Avenues, to Concrete Engineering Co.

Los Angeles, 390 tons, subway at Union Passenger Terminal, to Concrete Engineering Co.

Los Angeles, 120 tons, alterations at Edison junior high school, to Blue Diamond Corpn.

Los Angeles, 334 tons, units A and B at Manual Arts junior high school, to Blue Diamond Corpn.

Los Angeles, 260 tons, Washington junior high school, to Blue Diamond Corpn.

Los Angeles, 427 tons, two bridges on Gaffey Street, to Blue Diamond Corpn.

Los Angeles, 144 tons, John Burroughs school, to Blue Diamond Corpn.

San Diego, Cal., 200 tons, Ford building at exposition, to Truscon Steel Co.

Pasadena, Cal., 168 tons, Washington junior high school, to Concrete Engineering Co.

Spokane, Wash., 200 tons, bins for Portland-Spokane Cement Co., to Pacific Steel Corpn.

Plumas County, Cal., 100 tons, State bridge over Feather River, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

Sacramento, Cal., 124 tons, Montgomery-Ward building; bids open.

Holiywood, Cal., 126 tons, post office; bids under advisement.

Los Angeles, 108 tons, Los Angeles Junior College; general contract awarded.

Huntington Park, Cal., 175 tons, high school; general contract awarded.

Newport Beach, Cal., 353 tons, State overhead crossing at Arches Intersection; bids to be taken within three months.

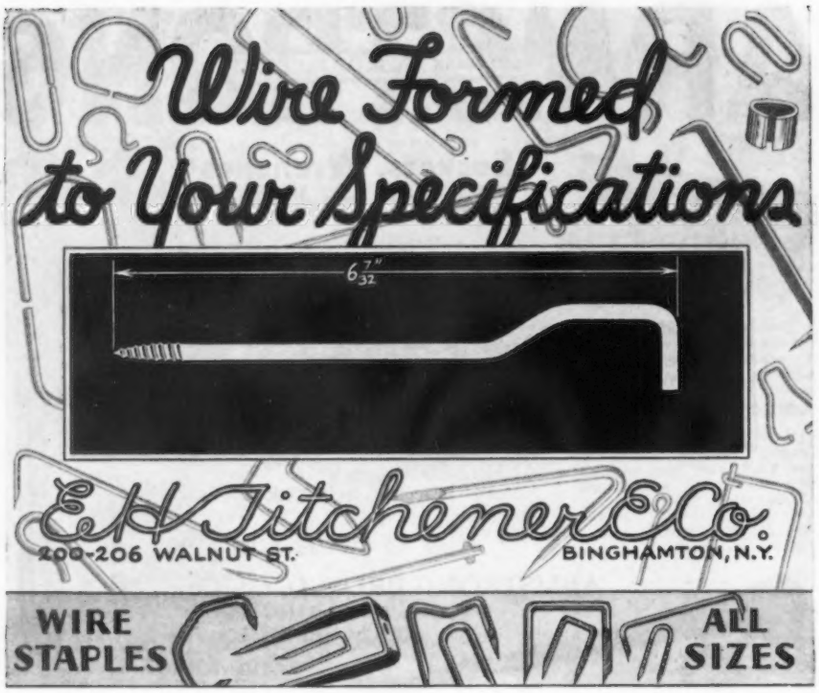
Los Angeles, 150 tons, Miramonte school; bids May 7.

Los Angeles, 750 tons, revised plans for San Gabriel dam No. 1; material to be purchased within one year.

Los Angeles County, Cal., 252 tons, State bridge over Tujunga Wash; bids May 16.

Quartermaster Depot, Army Base, Boston, will close bids May 10 on one motor analyzer, one 6000-lb. electric lift, one motor-driven grinder, one motor and radiator flusher, one air compressor, two lubricators, one power jack and other equipment.

Pacific Coast Steel Corpn., subsidiary of Bethlehem Steel Co., has opened a district office at 924 Kearns Building, Salt Lake City, with D. W. Stephens as manager.



Finishing Steel Barrels Used as Food Containers

(CONTINUED FROM PAGE 23)

are washed and wiped on the inside preparatory to lacquering.

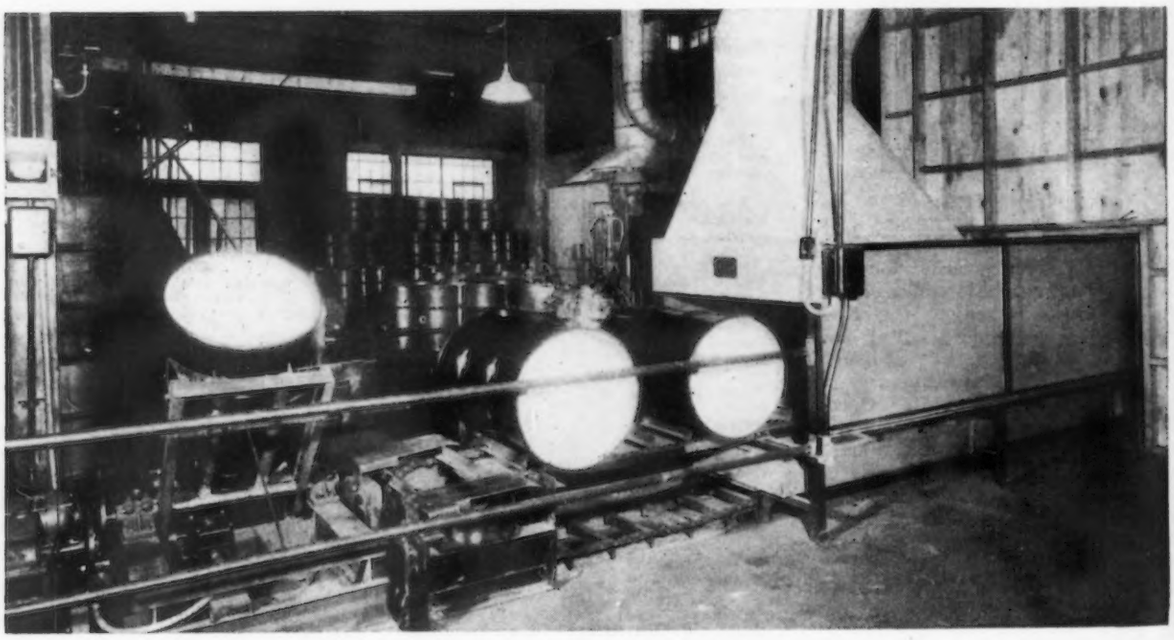
A conveyor carries the barrels to the finishing room and delivers them to a spray booth through an opening in the back of the booth. Attached on one side is a small booth for the covers, which are delivered on a gravity conveyor. In these two booths food lacquer is sprayed on the inside of the barrels and covers.

Sanitary Lacquer Applied to Uncoated Steel

The interior coating of the barrels is one of a group of coating materials designated by paint manufacturers as sanitary lacquers. It is an oil base product clear in color but produces a brown color after baking at 425 to 450 deg. Everyone is familiar with the inside coating of a tin can used for fruits and vegetables. This coating is a sanitary lacquer.

A recent development in this field of sanitary lacquers is the production of coating materials that can be applied to steel, making possible the use of large steel containers for food products. These lacquers are compounded to withstand acids and alkalis and are made in various formulae for protective coatings for steel containers for food products. To meet special requirements a different coating is provided for about every food product for which the barrels are used.

A continuous oven approximately 100 ft. long is located back of the spray booth and in this the barrels and tops are placed after



THE food barrels emerge from the finishing room through a cooling tunnel at the discharge end of the outer coat baking oven. Here an automatic up-ending machine sets them on end on another conveyor which delivers them to a gravity conveyor that takes the barrels to the carloading platform.

spraying and are baked at 450 deg. F. Work remains in the oven about 40 min. Work is handled through the oven on two conveyors. The main conveyor, which carries two barrels end-for-end, rolls the barrels through the oven to insure an even thickness of lacquer over the inner surface. Above this conveyor is a small conveyor which carries the covers through the oven in a flat position.

Exterior Is Enameled

After the baking operation, the covers, gaskets and sealing rings are assembled to the barrels. The completed and assembled barrel is then placed on another conveyor and moves to the other side of the finishing room, its course of travel being in the opposite direction from which it moved during the operations previously mentioned, and back to the entrance end of the room. On this side of the room it first passes through another spray booth in which a coating of synthetic enamel is sprayed on the exterior both for appearance and as a metal preservative.

During this spraying, the barrel rests on four live rollers which cause it to slowly revolve so that the entire circumference may be easily covered. Then the barrels pass in a single line through another continuous oven in which the exterior coating is baked at 250 deg. F. Leaving the oven, the barrels pass through a cooling tunnel which permits immediate handling without danger of marring. The discharge end of this tunnel extends through the wall from the finishing department into the main manufacturing room. Upon leaving the cooling tunnel the barrels, which have moved through the finishing department on their sides, are delivered by the power conveyor on which they are being carried on to an up-ending device which automatically sets them on end on another slat-type power conveyor traveling at right angles to the one from which they are discharged. This carries them to a point near the ceiling of the room and discharges them on to a long gravity conveyor at the side of the shipping room. This passes four doors, each serving a freight car on an adjoining loading track, and at each door is a switch permitting the barrels, by the movement of a lever, to be fed over a short branch conveyor to any one of four cars, or they may be taken off the conveyor and placed in storage.

Standard Barrels Get Outside Coating

The continuous production line for standard steel barrels does not differ greatly in its general features from the open-end food barrels. However, the spraying for the protective outside coating and the baking are done in the fabricating department.

The tops and bottoms are put on with a double-end seamer, after which the barrels are tested in water for leaks. Then they go through a washing machine in which high-pressure streams clean the barrels with Oakite and then with water, following which they

Here's an ALUMINUM FINISH with Bull-dog Grip!

Produces Beautiful Matte Silver Appearance at LOW-COST

You can do things with a Leaflex finish that you cannot do with many other aluminum finishes. For example, you can take the sample strip we send out on request, and you can bend it around a pencil—or you can twist it into spiral curls. The aluminum doesn't come off.

The same vehicle we use in our famous *Flexible Blue Knight* BLAX makes this aluminum powder finish work like a charm. In a LEAFLEX-finish, the flat-lying *(shingled)* aluminum particles are cemented into an almost continuous metallic film. Smooth—bright as a plated surface . . . . and permanently durable and flexible!

Many different industries have for several years used LEAFLEX on Steel, Brass, Die-Case Metal, Aluminum, Wood, etc. This money-saving finish stands up very well both indoors and outdoors. Extremely high coverage makes LEAFLEX a practical finish from the production point of view.

Because there are so many occasions where a beautiful, uniform, low-cost, cover-up finish is required, we suggest that you clip the coupon below and send it, attached to your letterhead to Dept. 802.

ROXALIN FLEXIBLE LACQUER COMPANY, INC., ELIZABETH, N. J.

ROXALIN Flexible FINISHES

CELLULOSE & SYNTHETIC TYPES ENGINEERED FOR SPECIFIC PERFORMANCE

DEPT. 802

Please send "Bender" booklet giving full information on LEAFLEX, and sample LEAFLEX-finished strip.

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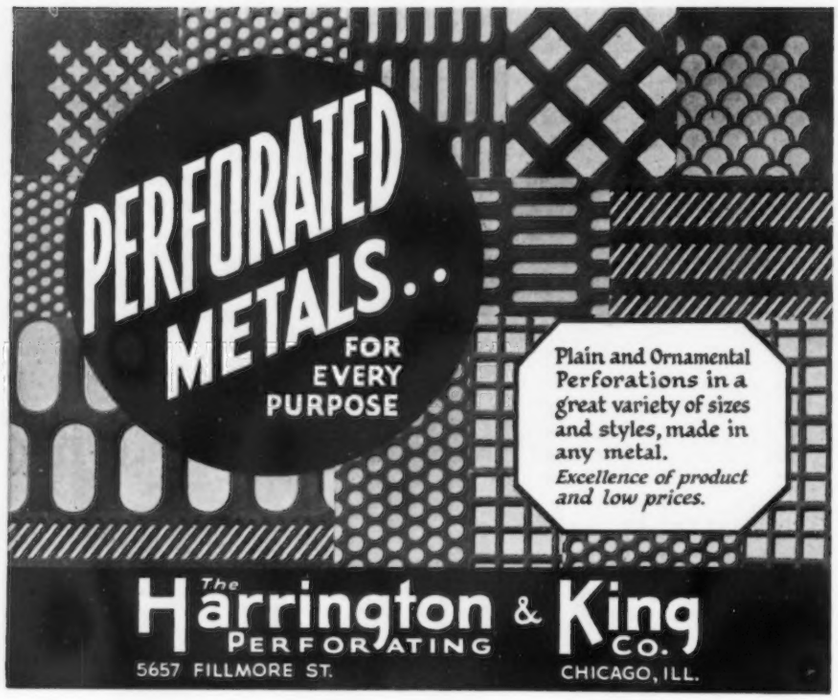
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pass through a chamber in which they are dried by the circulation of gas-heated air.

A gravity conveyor then takes the barrels to a spray booth for painting. A foot-controlled cradle picks up a barrel from the conveyor and places it on rollers, on which it rotates in the spray booth, and at the same time kicks the barrel that has just been spray-painted on to another conveyor. A stripping machine is located in this conveyor line for putting colored strips around the barrels if this stripping is specified. Then the barrels pass through an oven in which the paint is baked at 250 to 280 deg. F. The last section of this oven is a cooling chamber. Then the barrels move on conveyors to the carloading track.

All the new ovens are gas fired. Air passes through heating units above the ovens and is circulated by a blower system. The ovens and conveyors were supplied by the Smith-Mayer Corpn., Cleveland.

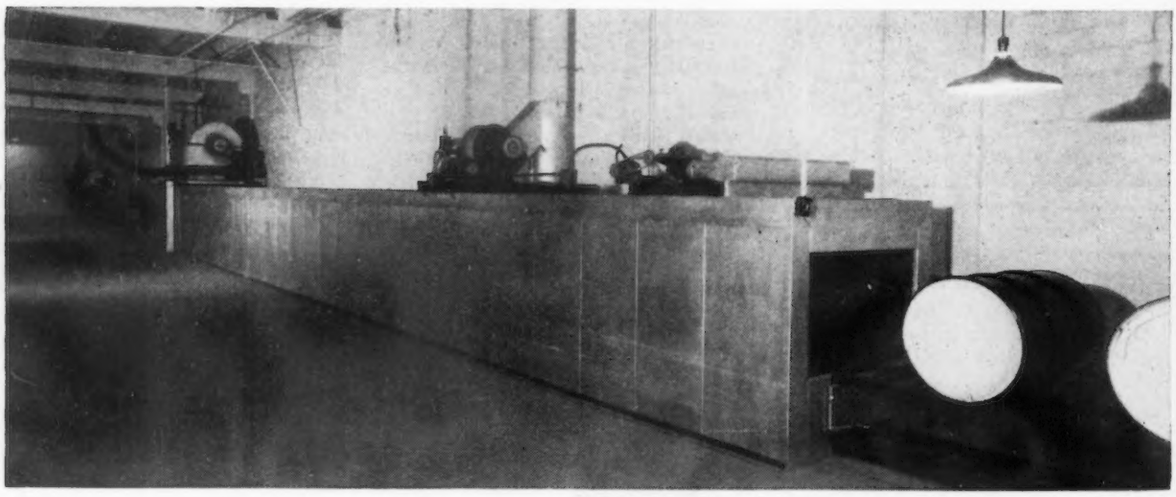
Conference on NRA Ends in Disagreement

WASHINGTON, April 30.—The conference today at the White House over the Clark resolution to extend NRA unchanged until next March ended in disagreement. As a result, Senator Pat Harrison, chairman of the Committee on Finance, announced that the committee will proceed at once with consideration of the Administration bill to extend NRA two years, together with amendments offered by Senator Harrison.

It is clear that discussion in the Senate over the bill will be prolonged and heated and it is expected that the measure will be greatly modified, eliminating such features as price fixing, restoring the full force of the anti-trust laws and confining regulation to interstate commerce.

Ford Places Order For Coke Ovens

THE Ford Motor Co. has awarded to the Koppers Construction Co., Pittsburgh, an order for two batteries of 61 Becker-type coke ovens, each to be installed at the Rouge plant at Dearborn, Mich., on the site of the present ovens. Half of the 240 ovens now in use are of the modern type and will be retained in service. The order, calling for expenditure of $3,250,000, is said to be the largest placed for coke ovens in seven years. This raises to a total of $27,000,000 Ford's outlay in a program of modernization and construction launched several months ago.



OVEN in which the exterior coating is baked. • • •

German Steel Industry Freed of All Export Restrictions Under Cartel

HAMBURG, April 22 (*By Special Correspondence*). — The German steel industry is virtually free of the export restrictions which were a great burden in 1934 due to the penalty payments for the exceeded allotments. Under threat of cartel dissolution, the industry has succeeded in getting a free hand in her export trade.

Steel production has also been advanced. The German allotment in the cartel has been increased 200,000 tons monthly due to the return of the Saar. This is approximately 30,000 tons more than actual production, while imports from France will be limited to 50,000 tons annually (from Lorraine) and the Saar-Lorraine coal-ore exchange agreements have been confirmed.

Reduction in production costs has been such that the German industry can easily meet sharp competition in world markets. The recent publications of Herr Dr. Vögler, of the United Steel Co., leave no doubt that Germany is now far less interested in the continuance of the international cartel —with or without Great Britain— than before, and would meet a dissolution with calmness.

It is also expected that German steel export figures will show a further substantial rise over 1934 and that the German industry, free of all restrictions, intends to foster steel export trade by all means, even if the international cartel should collapse.

Contrary to current opinion, collapse of the cartel seems to be at present improbable. At least, it will be kept up to allow a perpetual exchange of views and market organization regulations, even if price control, the most important item, should be abandoned.

Large Russian Orders Placed

Russia has placed a $29,000,000 order with Germany, in addition to the regular transactions. The steel industry is participating, as well as the machinery industry.

Specifications are being already sent in and it can be judged from the negotiations that the approximate distribution will be as follows:

Steel Products	In Thousands of Dollars
Semi-finished, chiefly sheet bars	450
Pig iron and alloys	250
Heavy plates, chiefly ship and boiler	420
Alloy steels, chiefly nickel-chrome and high-speed tool steels	1,000
Thin gage sheets, particularly below 28-gage	720
Hoops, chiefly cold-rolled	320
Broad flange beams	310
Corrosion resisting structural steel and sheet piling	550
Tubes, chiefly for oil boring	680
Steel castings	450
Wire products, chiefly ropes and mesh of special quality	120
Bolts, nuts and rivets	310
Other steel products	280
	5,810

Approximately 65,000 tons is included. Heavy machinery orders include:

	In Thousands of Dollars
Machine tools and metal-working machinery	11,200
Locomotives, rolling stock	3,100
Power machines, Diesels, etc.	2,200
Electrical machinery	1,100
Textile machinery	1,400
All others	3,900
	22,900

The devaluation of the belga has not yet had any unfavorable influence on the German market. It is certain that the Belgian and German steel industries are trying to come to an understanding as regards sales policies in such markets where non-cartel competition is strongest. Belgian industry will try to expand sales by meeting lower prices of the competition in these disputed markets, particularly where heavy import duties are a serious obstacle. Such markets are: England, Central America, British Indies and Colonies. The German industry will continue to foster barter trading and sales in such markets where competition is not so keen.

Under an agreement applying only to the sale of industrial electro-chemical instruments and certain types of flowmeters, George Kent, Ltd., London, England, will not offer its industrial electrochemical instruments or its flowmeters for sale in the United States or Canada, unless through the Leeds & Northrup Co., Philadelphia, and Leeds & Northrup will not offer its similar instruments in the British Empire, except Canada, unless through the Kent firm. Neither the sale in the United States by the Builders' Iron Foundry of Kent venturi and shunt-type rotary meters nor the sale anywhere by either company or its agents of products other than those specifically mentioned is affected.

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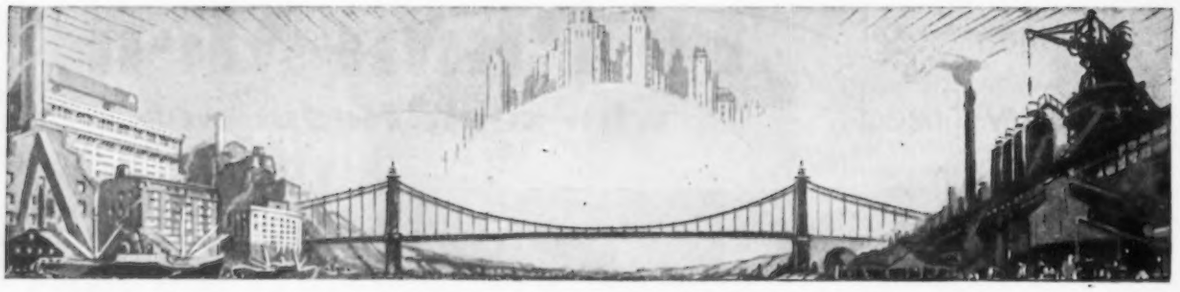

Plant Expansion and Equipment Buying

Labor Troubles Increase Automotive Tool Buying—Machinery Demand Maintained

THE strike in the Toledo, Ohio, plant of the Chevrolet Motor Co. has already resulted in the placing of orders for $300,000 worth of machine tools for the company's Muncie, Ind., plant. Equipment is also being moved to Muncie from other General Motors plants as the corporation seeks to make itself independent of labor tie-ups in individual production units. Also of interest to the machine tool trade are the plans of many automotive companies to increase capacity for 1936 production, which will result in equipment orders later in the year.

April was a good month with some machine tool makers. The Warner & Swasey Co., Cleveland, for instance, took an order for nine turret lathes from one middle western company and for six from another. Its April business was the best in five years.

The Loew Mfg. Co., Cleveland, will build a complete plant for the manufacture of bottle washing machinery and will buy $1,000,000 worth of equipment. The Electro-motive Corpn. expects to issue the machine tool list this week covering the requirements of its Diesel locomotive plant at Chicago.

◀ NORTH ATLANTIC ▶

National Lead Co., 111 Broadway, New York, has let general contract to William Kennedy Construction Co., 215 Montague Street, Brooklyn, for three-story addition to white-lead works, Brooklyn. Cost over $50,000 with equipment. William Higginson & Son, 101 Park Avenue, New York, are architects.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until May 6 for six fixed counterweight bell buoys (Proposal 48515).

Insular Terminal Corpn., foot of Forty-fourth Drive and East River, Long Island City, plans rebuilding sugar storage and distributing warehouse unit, recently destroyed by fire. Loss over $100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 7 for one 80-in. measuring machine (Schedule 4940), for Brooklyn Navy Yard; seven aerial grinders and buffers (Schedule 4912), for Brooklyn, Philadelphia and Charleston yards; until May 10, pressure lubricating guns (Schedule 4915), for Brooklyn, Portsmouth, Mare Island and Puget Sound yards; 680 electric soldering irons (Schedule 370), for Brooklyn, Pensacola, Mare Island and Puget Sound yards.

Anglo-American Mining Corpn., Ltd., 11 Broadway, New York, has let general contract to J. E. Knapp Co., Balboa Building, San Francisco, for new cyanide reduction mill at Yellow Astor gold-mining properties, Randsburg, Cal. Cost about $175,000 with machinery. Hamilton, Beauchamp & Woodworth, Inc., 564 Market Street, San Francisco, is consulting engineer.

Signal Supply Officer, Army Base, Brooklyn, asks bids until May 13 for 1100 cranks (Circular 119), 44 ammeters (Circular 120), ball bearings, etc. (Circular 121); until May 14, switches, jacks, resistors, sockets, capacitors, etc. (Circular 122).

American Automatic Oil Heating Corpn., Brooklyn, has been organized by Gilbert Lieb, 8 Mayo Street, and Meyer Liebewitz, 2028 East Ninth Street, both Brooklyn, to manufacture oil-burning equipment.

Penn-Maryland Corpn., 120 Broadway, New York, a subsidiary of National Distillers Products Co., same address, has plans by Sanderson & Porter, 52 Williams Street, architects and engineers, for addition to distillery at Carthage, Ohio, including new mechanical-bottling works. Cost about $150,000 with equipment.

United States Engineer Office, First District, New York, asks bids until May 7 for castings, including suction elbows, swivel pipes, etc. (Circular 290), portable sand and gravel scrubbing, crushing and screening plant (Circular 282).

Borough Council, Verona, N. J., will soon take bids for new sewage treatment and disposal plant, including digesters, feed machinery, conveyors and other equipment. Fund of $191,000 has been arranged through Federal aid.

Luscombe Airplane Development Corpn., Trenton, N. J., has been organized by Donold A. Luscombe and associates, Mercer Airport, Trenton, to manufacture airplanes and parts. Company recently leased one-story hangar at airport noted and is remodeling for factory. Former plant at Municipal Airport, Kansas City, Mo., will be removed to new location, where initial work will be concentrated largely in assembling of fabricated metal cabin planes, military planes and other aircraft. New company is capitalized at $75,000. Reginald L. Brooks will be one of officials.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 7 for following motor driven machines: One turret lathe (Schedule 4974), one milling machine (Schedule 4975); until May 10, one drilling machine (Schedule 4889), two drilling machines (Schedule 4890), one drilling machine (Schedule 4891), one drilling machine (Schedule 4892), one drilling machine (Schedule 4893), one drilling machine (Schedule 4894), one drilling machine (Schedule 4895), one automatic lathe (Schedule 4896), one automatic lathe (Schedule 4897), one internal grinder (Schedule 4898), one surface grinder with hydraulic drive table (Schedule 4899), one surface grinder (Schedule 4901), one rotary surface grinder (Schedule 4902), one rotary grinder (Schedule 4903), one surface grinder (Schedule 4904), one grinder (Schedule 4905), one internal grinder (Schedule 4907), for Philadelphia Navy Yard.

Commanding Officer, Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, asks bids until May 15 for one motor-driven centrifugal pump with accessories (Circular 338).

◀ NEW ENGLAND ▶

Quartermaster Depot, Army Base, Boston, asks bids until May 10 for one motor-driven grinder, one air compressor, one motor analyzer, one 6000-lb. capacity electric lift, one power jack, one portable variety wood-working machine, two lubricators, etc. (Circular 110).

Florence Stove Co., School Street, Gardner, Mass., manufacturer of oil and gas stoves, parts, etc., has plans for three-story and basement unit, 50 x 90 ft., and one-story structure, 70 x 100 ft. Cost over $75,000 with equipment. Frank D. Chase, Inc., 307 North Michigan Avenue, Chicago, is architect and engineer.

Stamford Metallizing Co., Inc., Stamford, Conn., has been organized by George Dimenstein and Harry H. Garland, Jr., 92 Grove Street, to manufacture metal tanks, vaults and kindred products.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 7 for 235 steel shells, rolled and brazed or welded; 235 seamless steel shells; 227 phosphor bronze shells, rolled and brazed or welded, and 227 seamless phosphor bronze shells (Schedule 4916), for Newport, R. I., Navy Yard; two motor-driven boring machines (Schedule 4938), for Boston yard.

Board of Selectmen, Westfield, Mass., has plans for new two-story automobile, service and repair building, 60 x 120 ft., for municipal cars and trucks. Cost close to $50,000 with equipment. Ralph M. Sizer, 24 Chestnut Street, is architect.

Boston Pressed Metal Co., 171-173 Union Street, Worcester, Mass., has consolidated

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BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* **BUFFALO, N.Y.**

its manufacturing activities with another New England manufacturer and entire machinery and equipment of Worcester plant will be sold at auction May 7. F. R. Shore, president of Industrial Plants Corpn., Columbus, Ohio, will conduct sale.

OHIO AND INDIANA

J. Schrader Co., 419 High Avenue, S. E., Cleveland, manufacturer of lighting fixtures and equipment, has acquired two-story factory on Fenwick Avenue, for new plant, increasing present capacity. Company will remove to new location in June.

Fromson & Davis Co., 3300 West Sixty-fifth Street, Cleveland, meat packer, will soon take bids on general contract for one-story and basement addition, 60 x 150 ft. Cost about $50,000 with equipment. George S. Rider Co., Marshall Building, is architect and engineer.

Bissett Steel Co., 945 East Sixty-seventh Street, Cleveland, distributer of steel and iron products, will soon take bid on general contract for one-story addition, 60 x 90 ft., for storage and distribution.

City Council, Sylvania, Ohio, plans new municipal electric light and power plant. Cost close to $150,000 with equipment. Financing will be arranged through Federal aid. George Champe & Associates, Nicholas Building, Toledo, Ohio, are consulting engineers.

Grahing Brothers Co., 4603 Fenwick Avenue, Cleveland, manufacturer of lighting fixtures and equipment, has leased former plant of B-Line Boiler Co., East 131st Street and Taft Avenue, N. E., totaling about 23,000 sq. ft. floor space, for new plant, removing present works to new location and increasing capacity.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until May 6 for steel tape armored cable (Circular 688); until May 9, 54 motor-generators (Circular 693); until May 14, 1000 fuel pressure signal assemblies (Circular 687); until May 16, 5000 target assemblies (Circular 685); until May 20, starter assemblies (Circular 695).

Sullivan Stove Foundry, Inc., 201 South Broad Street, Sullivan, Ind., has been organized by Harry L. Smith and Clinton Fisher, Sullivan, to manufacture stoves and stove parts.

Board of Public Works, Crown Point, Ind., plans early call for bids for pumping machinery and auxiliary equipment for new municipal waterworks station. Cost close to $40,000 with machinery. Charles Brossman, Chamber of Commerce Building, Indianapolis, is consulting engineer.

National Liquor Corpn., Indianapolis, has leased four-story building at 111 South Pennsylvania Street for new storage and distributing plant.

BUFFALO DISTRICT

Geneva Foundry Corpn., Geneva, N. Y., manufacturer of metal castings, has let contract to H. H. Robertson Co., Grant Building, Pittsburgh, for rebuilding one-story foundry recently destroyed by fire. Cost close to $50,000 with equipment.

Board of Education, Poland, N. Y., plans manual training department in new two-story school, for which bids will be asked on general contract in about 60 days. Cost about $240,000. R. E. Sluyter, Herkimer, N. Y., is architect; L. C. West, 134 Harvard Place, Syracuse, N. Y., is engineer.

Griffith Laboratories, Ltd., 532 Eastern Avenue, Toronto, Ont., manufacturer of bakers' and packers' equipment and supplies, subsidiary of Griffith Laboratories, Inc., 1415 West Thirty-seventh Street, Chicago, has approved plans for new one-story plant at Leaside, providing about twice present floor area. Cost over $40,000 with equipment.

WASHINGTON DIST.

Constructing Quartermaster, Aberdeen Proving Ground, Aberdeen, Md., asks bids until May 6 for dust-collecting system for local shop (Circular 15).

Blackstone Weaving Co., Blackstone, Va., plans one-story machine shop in connection with other additions to textile mill. A one-story steam power house will also be built. Entire project will cost over $60,000. Bryant & Terhune, 2 Rector Street, New York, are consulting engineers.

Board of District Commissioners, District Building, Washington, asks bids until May 10 for one planer and jointer, three drill presses, two lathes, one band saw, one mortiser, two sanders, one grinder, one scroll saw, one squaring shear, one saw bench, one wood trimmer, one filing machine saw, one grindstone frame, one lathe, one buffer, one gas furnace and one cut-off machine.

General Purchasing Officer, Panama Canal, Washington, asks bids until May 8 for six hand pumps, globe valves, gate valves, angle valves, bibb cocks, 6000 sq. ft. steel wire cloth, 10,000 lin. ft. poultry netting, 100 galvanized range boilers, 300 brass cleanouts, sheet-brass grommets, pipe fittings, etc. (Schedule 3050).

Rustless Iron Corpn. of America, Inc., 1001 Edison Highway, Baltimore, will soon begin superstructure for one-story addition, 60 x 60 ft., for wire production. Cost about $25,000 with equipment. Engineering Contracting Corpn., 504½ St. Paul Street, is general contractor.

United States Engineer Office, Engineer Board, Fort Belvoir, Va., asks bids until May 6 for 4000 ft. flexible steel armored

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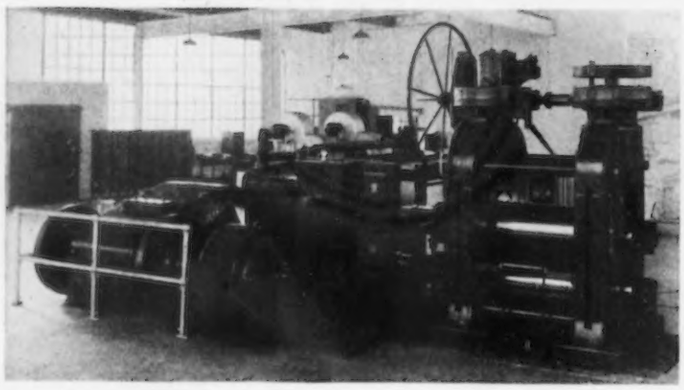

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UNIT CONSTRUCTION—All units on one bedplate, or separate bed construction.

Farrel engineers will welcome the opportunity to confer with you on your rolling mill requirements and assist in the decision as to which of the alternative construction features are best suited to your individual needs.

Farrel Rolling Mill equipment also includes: Chilled Iron and Special Alloy Iron or Steel Rolls—Universal Mill Spindles—Rod Mill Tables and Manipulating Equipment—Rod Coilers—Lead Presses for Pipe or Rod —Roll Grinding Machines—Roll Calipers—Gears and Pinions—Drives up to 10,000 H.P.

FARREL-BIRMINGHAM

Company, Inc.

100 Main St., Ansonia, Conn.

cable, 3000 ft. stranded single-conductor cable, box connectors, etc. (Circular 4).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 7 for 52,000 lb. seamless brass tubing for Portsmouth Navy Yard (Schedule 4929).

SOUTHWEST

Western States Grocery Co., Vernon, Los Angeles, wholesale grocer, plans new two-story, two-unit factory branch, storage and distributing plant at Tulsa, Okla., occupying two entire blocks. A cold storage and refrigerating plant will be installed. Cost about $400,000 with conveying, loading and other mechanical-handling equipment. Tulsa offices are at 7 North Detroit Avenue; S. M. Bowers is district manager.

H. Sokolik Packing Co., 1719 North Vandeventer Avenue, St. Louis, meat packer, has let general contract to A. H. Haeseler Building & Contracting Co., 2346 Palm Street, for one-story and basement addition, 50 x 55 ft. Cost about $40,000 with equipment.

Kansas City Southern Elevator Co., Board of Trade Building, Kansas City, Mo., affiliated with Moore-Seaver Grain Co., address noted, has asked bids on general contract for addition to grain elevator unit, 75 x 92 ft., at Topping Avenue and line of Kansas City Southern Railroad. Cost about $100,000 with equipment. Horner & Wyatt, Board of Trade Building, are consulting engineers.

City Council, Little Rock, Ark., has asked bids on general contract for new one-story hangar and administration building at municipal airport, with shop and reconditioning facilities. Cost close to $75,000 with equipment. Thomas Harding, Donaghey Building, is architect.

Common Council, Savoy, Tex., asks bids until May 6 for deep-well pumping machinery and accessories, elevated steel tank on 100-ft. steel tower, pipe lines, etc., for municipal waterworks. Charles E. Haydon, Denison, Tex., is consulting engineer.

City Council, San Angelo, Tex., has called special election May 14, to approve bond issue of $900,000, fund to be used for new municipal electric light and power plant and distribution system. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

B. F. Goodrich Co., Akron, Ohio, has acquired 10,000 sq. ft. additional floor space at 4481 Duncan Avenue, St. Louis, for a retreading plant. Cost about $10,000.

Federal Machine & Tool Co., 4480 Hunt Avenue, St. Louis, has been organized to conduct a machine and tool repair shop.

Bill-O-Type Corpn., 418 Olive Street, St. Louis, has been organized to manufacture a patented billing machine that can be used with an ordinary typewriter.

SOUTH CENTRAL

McCullough's Green River Distillery, Inc., Owensburg, Ky., is planning new works on local site, with power house, machine shop and other mechanical departments. Cost close to $100,000 with machinery. Federal permit is being secured.

United States Engineer Office, Second District, New Orleans, asks bids until May 9 for 120,000 sq. ft. galvanized wire fabric (Circular 510).

Common Council, Sheffield, Ala., will take bids soon for new municipal electrical distribution system, including substation facilities and transmission line for connection with TVA system. Fund of $230,000 has been secured through Federal aid. Lude & Adler, Inc., Woodward Building, Birmingham, is consulting engineer. City Council, Tuscumbia, Ala., has plans by same engineers for similar electrical distribution system, for which bids will be called soon. Appropriation of $130,000 has been arranged for latter project.

United States Engineer Office, Memphis, Tenn., asks bids until May 9 for two batteries of externally-fired marine boilers and auxiliary equipment (Circular 341 F).

George T. Stagg Co., Frankfort, Ky., plans extensions in distilling plant, including new buildings and equipment. Cost over $50,000 with machinery. Cary J. Kiefer, Schmidt Building, Cincinnati, is engineer.

MIDDLE WEST

Griffin Wheel Co., 445 North Sacramento Street, Chicago, manufacturer car wheels, etc., has let general contract to Samuel Rubenstein, 532 North La Vergne Avenue, for one-story addition to mill, 120 x 200 ft. Cost about $100,000 with equipment. George E. Wolff is company architect, first address noted.

Olson Rug Co., 2800 North Crawford Avenue, Chicago, will soon begin construction of new power house, in connection with six-story mill addition, for which general contract was let recently to Lundoff-Bicknell Co., 100 North LaSalle Street. Cost over $400,000. Weiss & Niestadt, 343 South Dearborn Street, are architects.

Public Utility Commission, Owatonna, Minn., asks bids until May 13 for addition to municipal power plant. Cost about $70,000 with equipment. Frank Snyder is superintendent of plant.

Dubuque Star Brewery, Fourth Street Extension, Dubuque, Iowa, plans three-story addition, 35 x 65 ft. Cost over $50,000 with equipment.

Ford Products Corpn., Kankakee, Ill., manufacturer of metal products, has ar-

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NO master ever prepared his canvas with greater care than must be given to Nickel Silver for the etching of jewelry, novelties, panels and the many other articles that lend themselves to this distinctive type of embellishment—for the acid process of design calls for a surface that is even-grained and blemish-free over its entire area. "Spills," scratches and other flaws in the raw sheet refuse the etch, and no amount of after work will prevent them from showing in the finished product.

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In the Seymour plant, each heat is analyzed by the laboratory before it leaves the casting shop. If approved, it receives a heat number. After that, tests are made at all stages of manufacture for grain structure, hardness, ductility, etc. Should a sample fail at any point, the mix is located by the heat number and promptly withdrawn. The result is that consistent level of high quality which has enabled such a large number of fabricators to *standardize* on Seymour Nickel Silver.

If this is of interest to you, we would like to send you samples for testing purposes.

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By-product and Steam

COAL

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ranged for purchase of plant and business of Andrews, Field & McCormick, Chicago, manufacturer of bar metalware specialties, etc. It is planned to remove plant to Kankakee, where production will be concentrated and expanded.

Haskins Brothers & Co., 115 Hickory Street, Omaha, Neb., manufacturers of soap products, have begun superstructure for new one-story and basement machine shop, 48 x 50 ft. Cost about $25,000 with equipment.

City Council, Sioux Falls, S. D., has authorized plans for extensions and improvements in municipal electric light and power plant, including 3000-hp. generator unit and accessories. Cost about $170,000. R. E. Bragstad is city engineer.

MICHIGAN DISTRICT

Superior Tool Works, 6633 Rohns Street, Detroit, have let general contract to C. E. Daniel Construction Co., 10410 East Jefferson Street, for one-story addition, 30 x 111 ft. Cost over $50,000 with equipment. Pollmar, Ropes & Lundy, 2539 Woodward Avenue, are architects.

Trenton Valley Distillers Corpn., Trenton, Mich., will soon begin erection of a one-story, 50 x 150 ft., mechanical-bottling unit. Cost over $50,000 with machinery. Company has work under way on a one-story addition, 75 x 210 ft., for storage and distribution, for which general contract recently was let to Culbertson & Kelly Co., 872 West Milwaukee Avenue, Detroit, to cost approximately a like sum, with equipment.

Inland Refineries, Inc., Pontiac, Mich., have plans for new oil refinery at Drayton Plains, Oakland County, Mich. Cost over $80,000 with machinery. E. G. Guy is consulting engineer.

Electro-Tool, Inc., Grand Rapids, Mich., has been organized by Walter M. Hanson, 921 Knapp Street, N. E., and associates, to manufacture tools and kindred mechanical equipment.

Aluminum Co. of America, Inc., 3311 Dunn Road, Detroit, plans one-story addition, 35 x 310 ft. Cost over $100,000 with equipment. Company headquarters are in Gulf Building, Pittsburgh.

WESTERN PA. DIST.

Erie Corrugated Paper Box Co., Erie, Pa., recently organized to manufacture corrugated boxes and containers, plans early erection of one-story plant, for which site has been acquired. Cost over $100,000 with machinery. Erie Chamber of Commerce, J. K. Shields, secretary, has been active in project.

United States Engineer Office, Pittsburgh, asks bids until May 8 for 18 cast steel slide gates for reservoir dam on Tygart River, W. Va. (Circular 346).

West Virginia Brewing & Ice Co., Parkersburg, W. Va., care of H. G. Smith, Parkersburg, head, recently organized with capital of $750,000, is considering new brewery at Bluefield, W. Va., with power house, machine shop and other mechanical departments. Cost over $100,000 with equipment. A similar plant is also being projected near Charleston, W. Va.

SOUTH ATLANTIC

Chevrolet Motor Co., McDonough Road, Atlanta, Ga., with headquarters at Detroit, has low bid on general contract from A. K. Adams Co., 542 Plum Street, N. W., Atlanta, for one-story addition to local parts plant and assembling unit, 100 x 200 ft. Cost about $100,000 with equipment. Albert Kahn, Inc., Detroit, is architect. Company is a subsidiary of General Motors Corpn., which is considering erection of one-story factory branch for repair parts, assembling and other service for all company products at Charlotte, N. C., developing as Southern supply center. Cost over $175,000 with equipment.

United States Engineer Office, Jacksonville, Fla., asks bids until May 6 for two cast steel propellers (Circular 897), two carbon steel propeller tail shafts (Circular 898).

Henderson Coca Cola Bottling Co., Henderson, N. C., has let general contract to Patterson & Carter, Inc., Henderson, for one-story mechanical-bottling works. Cost about $30,000 with equipment.

PACIFIC COAST

American Forge Co., 25 Tehama Street, San Francisco, manufacturer of iron and steel forgings, has let contract to Moore Dry Dock Co., Oakland, Cal., for steel framing for new one story mill, 150 x 150 ft., at Berkeley, Cal. Cost over $85,000 with equipment. K. Theill, 580 Market Street, San Francisco, is consulting engineer.

Public Works Officer, Navy Yard, Mare Island, San Francisco, asks bids until May 8 for water distilling plant for naval station at Farallon Islands, Cal., including boiler unit, condensing equipment, pumping machinery, tanks, etc., for capacity of 400 lb. per hr. (Specification 7886).

Dinuba Fruit Growers Association, Dinuba, Cal., plans rebuilding part of packing plant recently destroyed by fire. Loss about $70,000 with conveying, loading and other equipment.

Bureau of Reclamation, Denver, asks bids until May 15 for two direct-connected, motor-driven, deep-well turbine-type pumping units for sump pumps, and two similar pumping units for drainage service at Boulder Dam power plant, Boulder Canyon project, Arizona-California-Nevada (Specification 682-D); until May 20, eight cast steel bulkheads with studs, nuts, tap bolts,

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give them AO GOGGLES, too

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The AO DURALITE-"50" is light, cool, comfortable. Its fuss-proof bridge provides easy, permanent adjustment to any face. Super Armorplate lenses provide maximum protection from impact.

GIVING A MAN a tool for work where an eye hazard exists, without giving him the proper goggles, is like giving him a dangerous weapon.

A flying chip, a piece of scale can cause an eye injury that quickly mounts to $1000—in lost time, production delays, medical and hospital expenses and increased insurance rates. An eye completely lost may cost far more—enough in many cases to buy the finest eye protection for 1000 men.

American Optical Company has developed a complete line of eye protection equipment that covers every known eye hazard. An AO industrial representative stationed in a branch office near you will be glad to work with you to see that your men get the right types of goggles for their jobs. To safeguard *their* eyes, and *your company's profits,* send for this man today.

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Manufacturers, for more than 100 years, of products to aid and preserve vision. Factories at Southbridge, Mass. In Canada, Consolidated Optical Co., Ltd. Branch offices in all principal industrial centers

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Many have learned through costly experience that it doesn't pay to take chances, because Wear, Weather and Corrosion make short work of inferior sheet metal. Careful buyers insist upon outstanding quality and years of service. That's why GOHI Pure Iron-Copper Alloy is the almost universal choice of those who demand the utmost value for their money. The longest-lived, low-cost ferrous metal, GOHI gives extra years of wear and satisfaction, and makes your sheet metal dollars go farther than you ever thought possible.

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PRONOUNCED "GO-HIGH" **SHEET METAL**

GOHI Pure Iron-Copper Alloy, is available in all sizes and gauges. Produced exclusively by The Newport Rolling Mill Company, Newport, Kentucky.

THE NEWPORT ROLLING MILL COMPANY . . . NEWPORT, KENTUCKY

gaskets, etc., for installation on flanged ends of 13-ft. diameter penstock pipes for future units, same power project (Specification 678-D).

Bell-Wyman Co., Yakima, Wash., agricultural implements, tractors, motor trucks, etc., is considering new one-story and basement building, 75 x 140 ft., for implement department, with repair and service shops. Present plant will be remodeled and extended for tractor and truck division, with new repair, service and parts shop and other departments. W. A. Bell is president.

Weyerhaeuser Timber Co., Tacoma Building, Tacoma, Wash., F. R. Titcomb, general manager, has let general contract to Alloway & Georg, Hutton Building, for new wood pulp mill at Everett, Wash., on site, 150 x 1500 ft. Cost over $1,500,000 with machinery. O. C. Shoenwerk, first noted address, is company engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 10 for woven metallic steel measuring tapes and steel rules for San Diego, Mare Island and Puget Sound navy yards (Schedule 4917); until May 14, three motor-driven precision lathes for San Pedro, Los Angeles station (Schedule 4931).

◀ FOREIGN ▶

Imperial Typewriter Co., Ltd., Leicester, England, manufacturer of typewriters and parts, plans addition on adjoining site. Present capacity will be increased about 50 per cent. Cost over $100,000 with equipment.

Scottish Wholesale Co-Operative, Ltd., Glasgow, Scotland, is considering erection of new pulp and paper mill near city. Cost close to $600,000 with machinery.

Ministry of Communications, Government of Mexico, Mexico, D. F., plans new terminal at Acapulco, on Pacific Coast, consisting of number of steel warehouse units, with installation of cranes, hoists and other mechanical-handling equipment. Cost over $350,000 with machinery. A similar project will also be carried out at Mazatlan, another Pacific Coast port, to cost close to like sum.

Dalton Cites Lack of Business Confidence

DISCUSSING the outlook in the steel industry at the annual meeting of the Youngstown Sheet & Tube Co., H. G. Dalton, chairman of the board, commented upon the fact that improvement has occurred largely in lighter lines of steel which go into consumers' goods and automobiles, while the demand for steel required for heavy or capital expenditures is still low.

"Until means can be found to increase the needs for this class of steel," said Mr. Dalton, "I believe we can expect little change from the situation now existing among the steel producers of these heavier materials. We hope the present large expenditures that Congress has authorized the President to proceed with may be the means of increasing capital goods expenditures. I still believe lack of confidence by the people as a whole continues to be our greatest bar to improvement; if that can be overcome, there is an abundance of latent opportunities both for capital and consumers' expenditures that would soon put us on the road to reasonable prosperity."

New Trade Publications

Draft Gages, Flow Meters and Manometers.—Meriam Co., Cleveland. Series of blueprint postal cards, seven of which illustrate manometers, flow meters, draft gages, pulsation absorbers and other instruments. One card gives a complete conversion table for measuring various elements by the manometer principle.

Galvanized Sheet Metal Specifications.—American Rolling Mill Co., Middletown, Ohio. Bulletin containing suggestions for sheet metal specifications for roofing where galvanized iron is to be used. A section is devoted to important facts relating to galvanized iron as a material for roofing.

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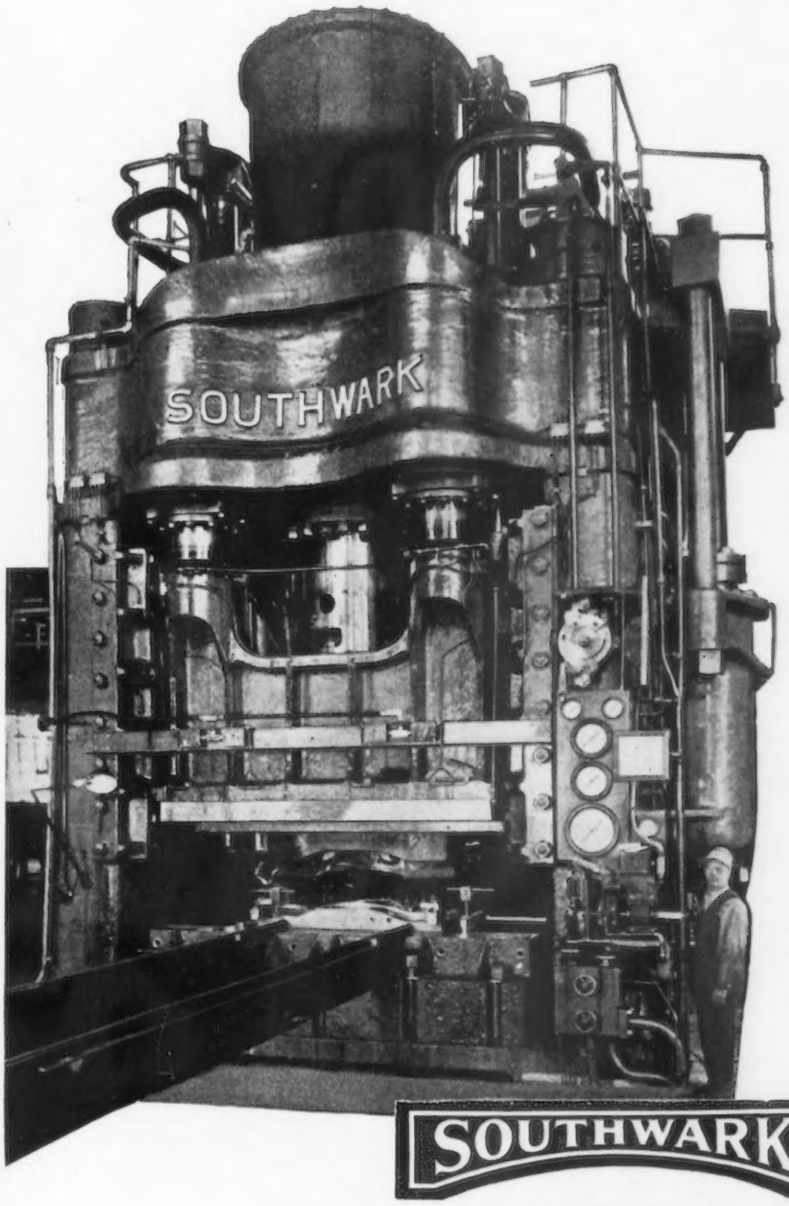
SOUTHWARK on any hydraulic press is the best guarantee that any user can have as to the efficiency of the machine.

For years the Southwark engineers have pioneered in hydraulics, never being satisfied that the ultimate has been reached.

Their latest achievement shown herewith requires no accumulators or other auxiliary hydraulic equipment. It has the speed—the accuracy—and the economy to revolutionize the practices in the industry for which it was designed and built.

★



Some of the ways in which this can be accomplished are:

1. Less expense in design and construction of dies
2. Die setting quicker and more convenient
3. No waste of product in adjustment after die change
4. Longer die life because there is no unnecessary overloading
5. Uniform pressure on every piece —fewer rejects — fewer returns for repressing
6. Less tearing of metal in sharp changes of contour
7. No possibility of machine breakdown due to incorrect setting
8. Better conformity to dies—speeding assembly of finished products.

★

SOUTHWARK

BALDWIN SOUTHWARK CORP.
SOUTHWARK DIVISION : : : : PHILADELPHIA
Pacific Coast Representatives: The Pelton Water Wheel Co., San Francisco

ILLUSTRATING round-bottom tanks for tube pickling under construction in our Darby, Penna., factory.

This design also practical for pickling wire in coils.

Tanks for continuous wire pickling process as well as for all other steel treating.

Material from 4 inches to 12 inches. Any length, depth or width. Shipped K.D. or set up.

G. WOOLFORD WOOD TANK MFG. COMPANY
Paschall P. O.—PHILADELPHIA, PA.
Factory: DARBY, PA.

Self-Alining Work Rolls For Four-High Mills

(CONTINUED FROM PAGE 37)

parallel wedges constitute no handicap to the operation of changing rolls. Removal of the longer wedge on each side of the roll housing provides ample clearance for withdrawing the work roll with its bearings and installing a new roll and bearing assembly. The removed wedges can then be replaced at the same setting, as indicated by the inner nut on the clamping bolt, or if necessary they can be drawn in further to eliminate lost motion. The opposite wedge on each side of the roll housing can be left in place permanently.

The fact should be mentioned that this device is not applicable to 4-high reversing mills, nor to the small middle rolls of 3-high mills which roll in both directions. When the direction of rolling is reversed, the direction of the axial force due to misalinement is likewise reversed; so that the endwise movement of the work roll and its bearings, instead of correcting the misalinement, would accentuate it.

After conducting comprehensive experiments and applying for patent protection, the Morgan Construction Co. last year placed this self-alining device in active operation on a small 4-high cold strip mill which is likewise equipped with Morgoil bearings. This unit has operated consistently in a most satisfactory manner, and has demonstrated in practice the advantages of positive roll alinement.

New Adjustable Bearing Clamp

Another useful device which has been developed for use with Morgoil bearings on 2-high mills is an adjustable bearing clamp. This device is designed to permit precision axial alinement of passes on mills rolling shapes. With Morgoil bearings all axial thrust loads in both directions are absorbed by a double-acting thrust bearing built into the Morgoil bearing on the working end of the roll so that no clamps on the drive side of the housing are necessary. The clamping device is constructed with two pairs of jaws hinged to heavy brackets attached to the housing posts. The jaws of the upper pair act on the outer face of the ears on the bearing casing, while the lower jaws engage the inner face. The jaws of each pair are connected by a heavy turnbuckle. Axial adjustment of the roll is readily made by slacking off on one turnbuckle and taking up on the other, or vice versa. Inasmuch as one turnbuckle is always in tension while the other is always in compression, all backlash in the hinge pins is eliminated and positive alinement can be maintained.

This type of clamping device affords several distinct advantages, namely:

(1) Due to its parallelogram construction, it is impossible for the roller to cramp the bearing in the housing window, as the bearing is always free to aline itself correctly in spite of the fact that it is always rigidly held endwise.

(2) Roll changes are made more readily than with the customary clamping dogs. The turnbuckles are slacked off only a sufficient amount to permit the removal of one hinge pin at the end of each turnbuckle. This frees the entire clamping device, which is then swung clear of the bearing casing.

(3) The position of the turnbuckles in relation to the housing makes them freely accessible when making adjustments. In addition, only two applications of a wrench are necessary, as against at least four or more when making adjustments with the conventional type of clamping dogs.

Yoloy, a New High-Tensile Steel

A NEW alloy steel has just been announced by the Youngstown Sheet & Tube Co. This new product, known as Yoloy, is a nickel-copper alloy steel, having an exceptional resistance to corrosion, high-tensile strength combined with high ductility, workability and weldability. Yoloy steel is produced in sheets, strips, plates, bars, shapes, wire and seamless pipe.

Railroad Equipment

Missouri Pacific has been authorized to purchase air-conditioning equipment for five passenger cars at cost of $17,500.

RAILS

Chicago & Eastern Illinois has ordered 2000 tons of rails from Illinois Steel Co. and 500 tons from Inland Steel Co.; 500 tons of tie plates were distributed in proportion to the rails.

Pere Marquette is in the market for 1100 tons of rails.

Because the NEW way is faster!

THE Europa, Rex, Normandie and Queen Mary exemplify the urge to do things faster. They are as far ahead of the old ocean-going side-wheeler as Zapon Lacquers of 1935 are an advance over the cumbersome paints of a day long gone.

Who, in this stiff-lipped commercial world, would think of *painting* a hundred thousand articles of a single sort laboriously by hand? This s-l-o-w-n-e-s-s would make familiar ten-cent articles *cheap* at many times their present price . . . and far less lovely.

When Zapon introduced the first pyroxylin lacquers half a century ago, it paved the way for those fast finishing methods which are now regarded as indispensable to modern production.

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You are invited to take advantage of our complete laboratory facilities in Stamford and North Chicago.

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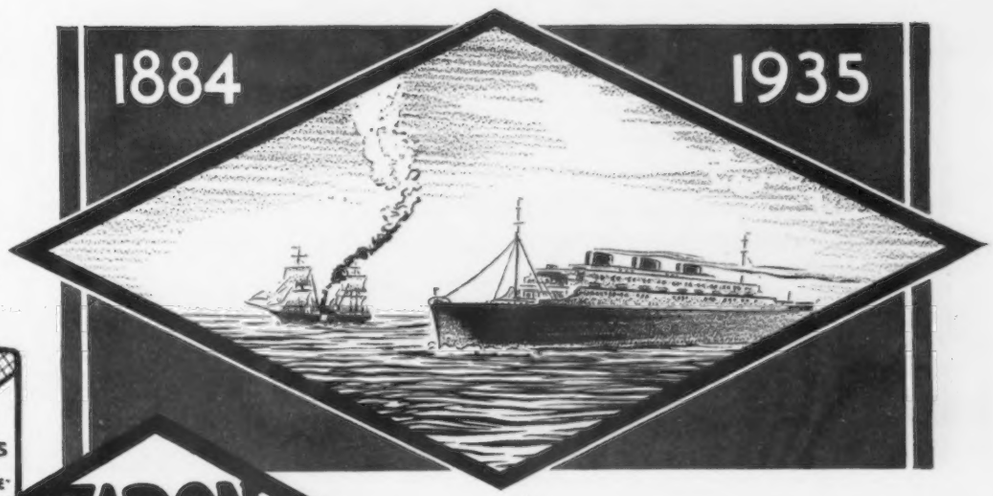
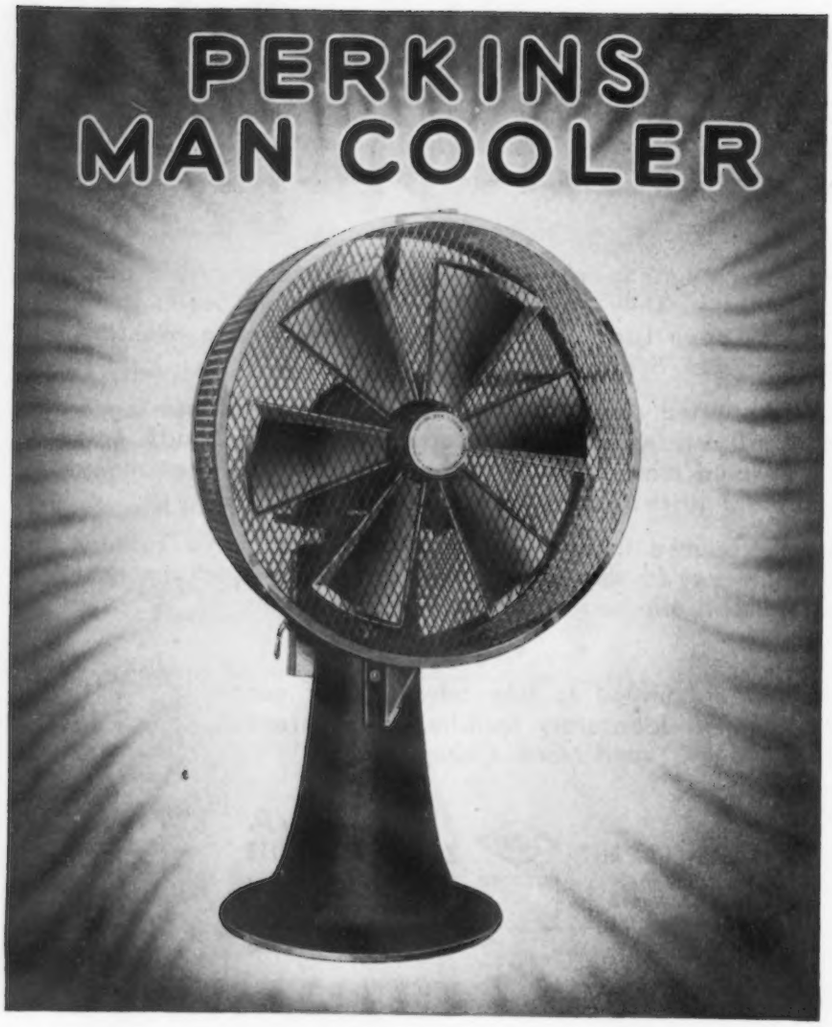
Radio & Radio Parts
Refrigerators
Silverware
Sporting Goods
Wood Products
Wood and Metal Furniture
Toys
and many others



LACQUERS BREVOLITE ENAMELS "VALUES THAT ENDURE"

ZAPON

LACQUERS



Oscillating and Stationary Types—Hundreds of users of Perkins Man Coolers have proven for themselves the wisdom of investment in Perkins Man Coolers.

Readily moved from place to place, they bring comfort to men working in hot places, resulting in decreased labor tunover, increased production and fewer accidents.

B. F. PERKINS & SON, INC., Holyoke, Mass.
ENGINEERS AND MANUFACTURERS

This Week on the Assembly Line

(CONTINUED FROM PAGE 47)

releases were more liberal in the past week, although only moderate in total volume. Some strip and sheet mills have full operations scheduled for the next two weeks. Ford probably will not place steel orders for June until next week. In balancing its stocks at Rouge, it recently has shipped sheets to Briggs Mfg. Co. for use on Ford work. Fisher Body gave some steel releases for Cleveland in the past week.

With at least three steel companies in a position to produce extra wide sheets by late summer, the use of sheets 90 in. wide by the automobile industry for 1936 cars is assured. Companies such as Fisher Body have not bought these sheets previously because they refuse to specify material for production purposes unless three sources of supply are available. One can stir an argument in Detroit any time by discussing which is cheaper—to buy very wide sheets and pay the width extras, or to weld two sheets together and then stamp the part. Fisher is understood to have experimented with welding two sheets longitudinally to make the turret top. This doesn't necessarily mean that any change is contemplated in the present method of stamping the turret top out of one piece of sheet steel.

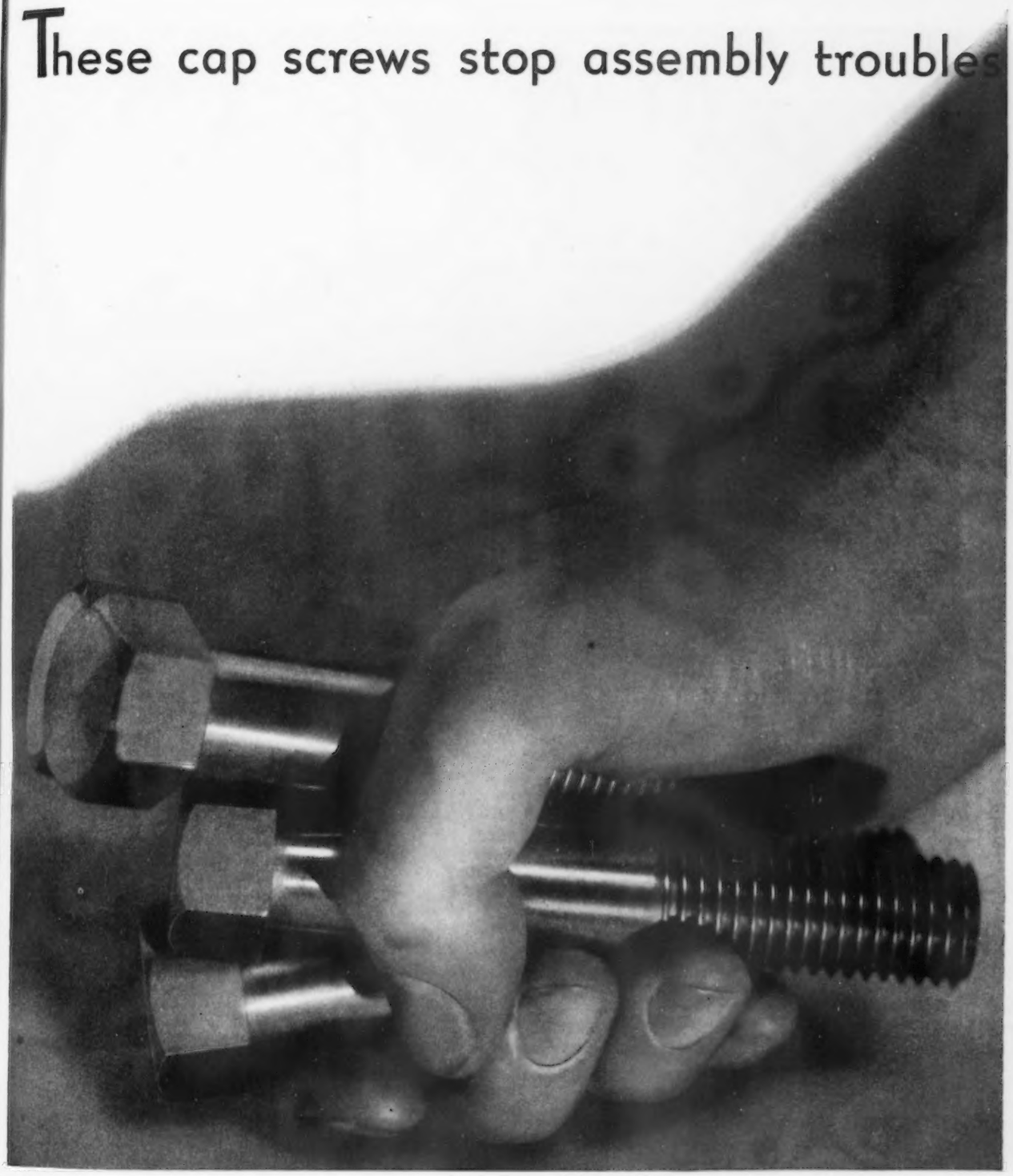
United Engineering Outlook Favorable

STOCKHOLDERS of United Engineering & Foundry Co., at the recent annual meeting at Pittsburgh, approved the two for one split in the company's common stock. The quarterly dividend on the old common stock was increased to 37½c. from the previous quarterly rate of 25c. George T. Ladd, president, in discussing the 1934 earnings, which equaled $1.58 on the common stock, attributed the improvement in net earnings to increased volume of sales. Business for 1935, he stated, is expected to equal, if not better, that in 1934. The machinery business carryover into 1935, according to Mr. Ladd, was approximately 80 per cent of the total actual completed sales for the entire year of 1934. Added to this volume, the United company entered into a Russian contract.

Mr. Ladd pointed out that the roll business has improved substantially over last year, and while not yet reaching the company's normal capacity, should show considerable profit improvement if the demand continues for a reasonable period in 1935. Much proposal work is being done at present, which Mr. Ladd believes indicates a demand for durable goods which has, for some time, hesitated because of the uncertain political situation.

The E. L. Essley Machinery Co., Chicago and Milwaukee, has been appointed exclusive sales agent for Van Norman millers. The Van Norman line has been completely redesigned and now incorporates self-contained motor drives, high spindle speeds, anti-friction bearings, and alloy gears. They are available in three sizes: the No. 6 No. 12, and No. 22 respectively.

These cap screws stop assembly troubles



PRODUCED in a plant specializing in the manufacture of cap screws for nearly two decades, our cap screws represent a stage in progress of cap screw manufacture difficult to achieve. The well-formed heads of Cleveland Cap Screws provide ample and speedy wrench hold. Made by the Kaufman Process, *patented,* our own plant development—heads will not shear or break, and threads are guaranteed to fit a Class 3 gauge. Catalog D and Price List is ready for your desk. Order from the factory or nearest warehouse stocks, or through your jobber.

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CLEVELAND CAP SCREWS

READY
for the RACE

Ample stocks in precision and commercial grades of steel bearing balls await only your order to speed them on the way for your final assembly in the races.

The ABBOTT BALL Co.
1047 New Britain Avenue
Hartford, Connecticut

ABBOTT BEARING BALLS

Openside Planer Features Extensive Electrification

(CONTINUED FROM PAGE 43)

these are marked: Feed start; feed stop; inch cut; inch return; automatic cut; automatic return; and stop. The stop lever, designated as the Westinghouse safety stop lever, protrudes from the bottom of the pendant station. It may be deflected in any direction, and it will cause all feeds and platen reciprocation to stop if deflected even the slightest amount.

The rheostats for adjustment of main motor speed are contained in the operator's control station. Two rheostats are provided, one for adjustment of the speed of cut and the other for adjustment of the return speed. In addition, a switch is provided for the selection of the cutting speed range. When on the low setting the cutting speed range may be varied from 150 to 300 r.p.m.; when on the high setting, the speed may be varied from 300 to 1500 r.p.m.

The operator's control station is arranged for separate mounting at a location convenient for the operator, while the main control panels can be located where desired.

Included in the control station is a switch for selecting the end of the stroke at which the feed will take place, control switches for the magnetic tool lifters, and the "tarry" selector switch.

Feeds Electrically Operated

Feeds are controlled by push buttons and selector switches at the end of the cross-rail and on the side head. The amount of feed is controlled by a Westinghouse measuring relay.

Magnetic clutches are used to interconnect the shafts to give a cross or a vertical feed. These clutches are controlled by the lever switches at the right of the cross-rail and on the side head. The lever switches also set up the required circuits to give the direction of feed, the direction of feed being obtained by causing the motor to rotate in the desired direction.

Use of magnetic clutches makes it possible to traverse any head in any direction at any time merely by depressing the proper push button. The four push buttons on the end of the cross-rail and on the side head are grouped in a diamond-shaped arrangement so that their location indicates their function. When any of the rapid traverse push buttons are depressed the proper clutch is energized and the motor started in the proper direction. If the lever switches have been set up for a particular feed for that particular head the feeding is stopped, the magnetic clutch opened and the proper magnetic clutch energized. When the push button is released the magnetic clutch will also release. Feeding will not restart unless the feed start button is again depressed.

The measuring relay is the heart of this electric feed control. This device, a new development, controls the amount of feed motion of the feed screw. It is mechanically coupled into the feed drive and is in effect an adjustable limit switch driven by the feed drive. It may be adjusted for any setting from 0.001 to 1.000 in. by movement of the dials at the end of the cross-rail and on the side head. When the feed motor starts the measuring relay is driven for a certain number of revolutions as determined by its setting; its contacts then open and cause the motor to stop. Thus the feed is definitely and accurately controlled by the movement of the head or slide as the case might be. This planer feed does not depend upon timing devices of any kind.

Tarrying Device a New Feature

The tarrying device, a new feature, is particularly useful in working in pockets or in places where there is not room to allow sufficient over-travel. The tarry is engaged by a selector switch on the operator's control station. Its operation is such that it will cause the platen to stand still until the feed has been completed and then automatically resume its motion completing the rest of the cycle.

Solenoids are built into the swivel pins on each head to operate the magnetic tool lifters. Each solenoid contains a plunger which pushes the tool holder up at the end of the cutting stroke. The solenoid holds the tool-holder up during the return stroke and is de-energized at the end of the stroke, allowing the tool-holder to fall for the next cutting stroke. These tool lifters are entirely automatic in operation. By means of selector switches on the operator's station any of the tool lifters may be switched in or out of operation as desired.

The cross-rail elevating push buttons are located on the end of the cross-rail. Cross-rail elevating and cross-rail clamp motors are interlocked and arranged to be operated from the same push buttons.

Get Rid of BOTTLE NECKS

In most production set-ups there is at least one slow operation—a bottle neck that keeps the whole system from moving efficiently. If that operation involves joining metals, change to production welding and speed up the entire system. Production welding offers a dozen different ways to step up production. High speed welding presses equipped with dial feeds, magazine feeds, or special work locators and ejectors have accomplished this for hundreds of products. Machines that make anywhere from two welds in series to a dozen welds at a time have done it for many more. No matter what your problem is there is a machine among the endless variety of standard or special welders manufactured by Thomson-Gibb that will not only do the job faster, but better and cheaper than ever before.

Let an engineer from Production Welding Headquarters look over the bottle neck in your set-up and recommend methods and machines that will remove it. As a representative of Thomson-Gibb, pioneer manufacturers and makers of a *complete* line of resistance welding equipment, he will be able to give you expert, unbiased advice.

THOMSON-GIBB ELECTRIC WELDING COMPANY

THOMSON PRODUCTION WELDERS GIBB

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MANUAL AND AUTOMATIC SPOT · SEAM · BUTT · FLASH PROJECTION · PORTABLE GUN AND SPECIAL WELDERS

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"GUSHER"
COOLANT PUMPS-

Can't be injured by chips or grit as there is no metal contact inside the pump. No priming or adjustments. Fewer parts due to elimination of packing nuts, foot valves, relief valves and strainers. Self cleaning. Large sealed ball bearings in motor and balanced thrust contribute to long life of trouble-free performance.

Before you buy another coolant pump, ask Ruthman for particulars on what's new in coolant pumps.

THE RUTHMAN MACHINERY CO.
Cincinnati, Ohio

Is the Technique of Iron and Steel Making Laggard?

(CONTINUED FROM PAGE 29)

The open-hearth furnace as well as all other refining operations uses the batch principle, the furnaces vary from the small 10 to 15-ton units to the giants of 300 to 400-ton capacity. In the United States the 100 to 150-ton size is the most economical and the most popular.

The time for each operation varies from 4 to 5 hr. to 16 to 20 hr. Average rate of production is 10 to 15 tons per hour, meaning average 10-hr. runs with 150-ton furnaces. This compares favorably with the average production rates of blast furnaces of 20 to 40 tons per hour (500 to 950 tons per day).

This intermittent character of the refining operation in batches is most often criticized and pious wishes are expressed that the continuous principle should be tried and developed.

These suggestions or criticisms are unwarranted and do not hold water at all. The object is to make a final product—steel, iron or alloy, in commercially desired quantities—1, 10, 100 or 1000 tons—to a prescribed analysis. A comparison with the bread-flour industry may help to clarify this point. The milling operations are continuous as is the blast furnace process. Flour, as well as pig iron, is an intermediate product offered in a few standardized qualities to be used as raw material for the ultimate products. Baking is of necessity a batch process and in very rare cases semi-continuous.

The commercial demand is for loaves of bread of differing shape, texture, taste and composition, and the requirements of the trade can only be met by circumscribing the production problems in batch form. The same condition prevails in the steel trade. The commercial orders are for definite tonnages, not for indefinite figures.

The practical point of view leaves no choice and eliminates all continuous-type solutions in the refining of steel as being only of paper value without a real future. A semi-continuous process may have a certain degree of justification if standard qualities of a certain product command a large sale, but so far this condition has not arisen.

Absence of Automaticity

The open-hearth process is radically different from the blast furnace process not only on account of the difference between the batch principle versus the continuity principle, but also because the blast furnace is closed and automatic, while the open-hearth furnace is open and has no definite fixed relationship between fuel and charge. The blast furnace operator can change but little the progress of the burden-fuel mixtures, while the open-hearth operator can positively control the sequence of his reaction and at will change the temperature gradient of his flame.

In Fig. 2 the typical material of an open-hearth furnace is shown in graphic form. Some 3.5 lb. of material is required to produce 1 lb. of steel, of which the combustion air makes up 2 lb. and produces 2¼ lb. of gases. This air combustion is, of course, a fair average corresponding to some 4,500,000 B.t.u. per ton of steel and can be used as a gage for the quality of the operator's skill. As pointed out previously, while it is practically impossible for a blast furnace man to change the coke rate more than 5 per cent from 90 to 95 lb. per 100 lb. of pig iron, for instance; it is not unusual at all to find successive open-hearth runs varying from 4,000,000 to 8,000,000 B.t.u. per ton produced under comparable circumstances.

This is the weakest spot of the open-hearth process and should be frankly recognized as pivotal point for future designs. The furnace should provide positive means of heat - flame - temperature control eliminating all guess work and giving the operator a positive and responsive tool so that he can concentrate on the metallurgical problems without distractions and side issues.

Control Features Are of Paramount Importance

The past decade has brought forth considerable progress in that direction but much remains to be done. Furnaces are better designed, walls are made tight, checkers are no longer sieve-like boxes, insulation is considered a necessity in all

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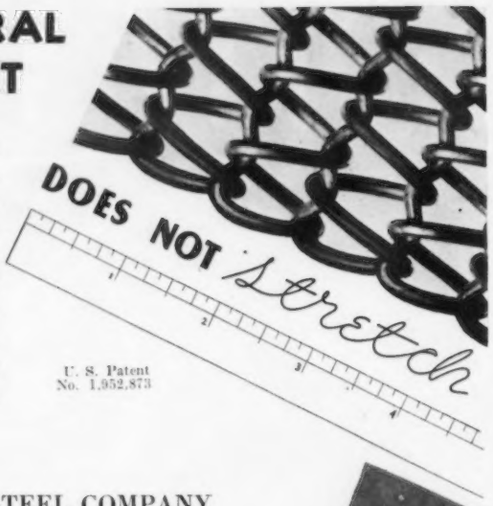

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parts of the furnace, refractories are of better quality and give promise of further improvement.

It cannot be denied that the open-hearth furnace has its inherent weakness. The flame, for instance, reaches the metal bath only through the poor heat-conducting layers of slag that swim on top of the molten mass; the temperatures are high, taking a heavy toll from the refractories. But in spite of these shortcomings, the open-hearth furnace is a very efficient apparatus of unsurpassed versatility and flexibility. It is a combination melting-refining instrument that is sound in principle and only weak in details which are within reach of correction by progressive design.

If higher oxygen concentrations were economically sound and practical, they would apply more to the open-hearth furnace than to the blast furnace, as the temperature needed to melt steel (2750 deg.) is some 500 deg. F. higher than that required to melt pig iron (2250 deg. F.). The flame temperatures used at present in the open-hearth are the highest in any industrial application outside of welding operations and cutting torches. The separation and independence of the combustion reactions from the metallurgical reactions form a much sounder background from the chemical point of view for the enriching of oxygen content of the combustion air. An increase of the temperatures from 3200 deg. or 3400 deg. F. to 4000 deg. looks like a decided improvement from the heat generation, heat absorption angle, although such a step would undoubtedly scare the refractory people.

The refractory manufacturers are alert and are offering new products better suited to the high temperatures and more resistant to the scorification and abrasion effects of the slag. Through thorough research a number of possibilities have been explored pointing to super-refractories that will enlarge the usefulness of the open-hearth process in the refining field.

Most industries have unavoidable losses inherent in the cycles used in their processes. In steam applications there has been a struggle with the latent heat of evaporation (950 to 1000 B.t.u. per pound of water) which permits only a net utilization of 300 to 400 out of 1200 to 1350 B.t.u. contained in a pound of the superheated steam. All efforts to date to obviate this condition have not succeeded in spite of the desirability of a more economic solution.

All combustion problems have to take into consideration the 3-to-1 dilution of the oxygen of the air by its nitrogen. And that applies also to the steam boiler field. Yet in the remarkable development of the central stations during the past decade no attempts were made to correct it. The reason is simple. The loss from that source is mostly imaginary because its effects often cancel themselves out on the overall heat balance. Moreover, the benefits of the flywheel effect of the volumes handled are forgotten or overlooked.

From this critical exposition it appears that the iron and steel industry has hardly to fear any revolutionary change in process or equipment. A number of minor improvements (or shall they be called major ones?) are bound to increase the efficiency and flexibility of blast furnaces as well as open-hearth furnaces. The stagnation due to the economic conditions of the past five years has accelerated the obsolescence factor which will have to be compensated by better design and more efficient construction. The revival of the industrial activity will demand greater operating economies which can be achieved by sound engineering evolution.

In advertising its products, the Central Iron & Steel Co., Harrisburg, Pa., agreed to discontinue use of the word "grating" to designate products not known to the trade and purchasing public as "open steel flooring," or "grating," following an agreement with the Federal Trade Commission. The stipulation points out that the company advertised "Central Non-Skid Grating" as permitting air and light to penetrate. "Can be had in any lengths and gage—does not have to be made in sections," the advertisement said. The stipulation says the product does not properly fall within the definition of "open steel flooring" or "grating" as those terms are understood by the trade, but is more accurately described as perforated or slotted steel floor plates.

A. M. Castle & Co., Chicago, have declared a special stock dividend of 5 per cent in addition to the regular quarterly payment of 50c. a share, both of which will be payable May 10 to stockholders of record April 25. Net profit for the first quarter of this year amounted to $83,695 after depreciation and taxes, equivalent to 69c. a share.

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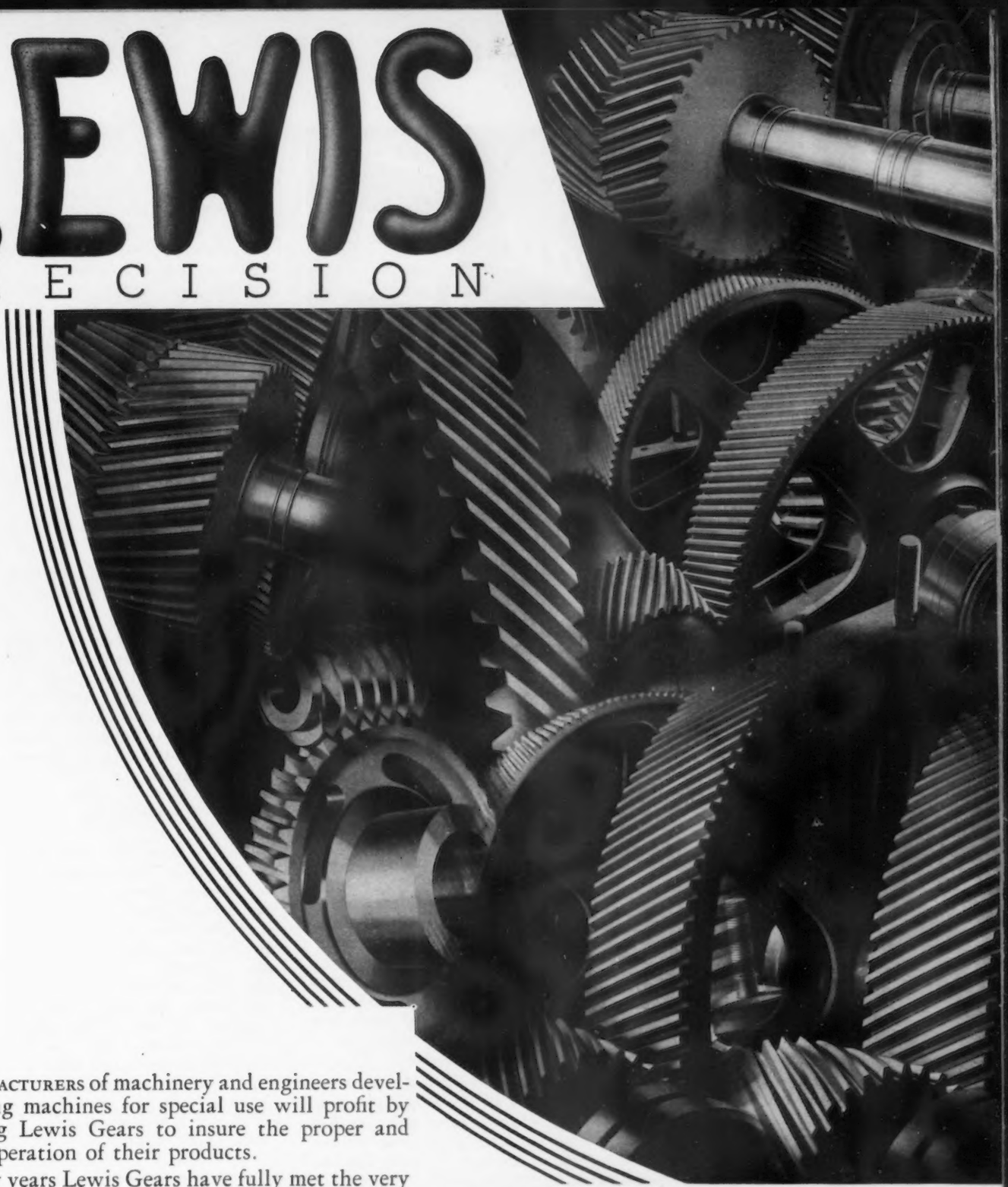

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Influence of Roll Neck Deflection on Bearing Life

(CONTINUED FROM PAGE 33)

sary on a narrow mill as on a wide mill.

It does not appear to be so necessary to use this device on top rolls because the screw and surrounding parts of the mill frequently have an inherent looseness and flexibility which permits the outward movement of the load side of the chocks so that self-alignment of the top bearing may take place on the conventional mounting. A period of time will be required to establish the necessity for the roller aligner on top chocks.

It is of interest to note that steel mill records show that there is much less trouble with bearings that are continuously used on top rolls as compared with bearings continuously used on bottom rolls. It is clear from examination that this condition is due to better load distribution obtained on top rolls than on bottom rolls with conventional mountings.

Although Bantam has always explained the superior wearing qualities of top bearings by the above theory, which has now been proved by actual measurements taken on operating mills, there have been two other opinions expressed on this subject as follows:

1. It has been stated that on top rolls, due to their positions, very little, if any, water and dirt gets into the bearings, whereas on the bottom bearings the water can run in by gravity and the majority of it will get into the bearing on the inside end.

2. Bottom bearings have more load because weight of roll and chocks must be added to load on bottom bearings whereas this dead weight is deductible from top bearings.

An examination of bearings operated on both bottom and top rolls under many different conditions and many different mills indicates the fallacy of the water and dirt theory. It is the belief of the Bantam company that the damage to the bearings is done by load and not by corrosion and dirt. Dead load is very small as compared to rolling load and the additional dead load could not possibly account for the much more rapid wear of bottom bearings as contrasted with top bearings. As a further indication that deflection is chief cause of failure, a changing of chocks from plain flat bottom to knife edge did to some extent ameliorate conditions.

A recent investigation of some of the latest 4-high strip mills has shown very rigid top mountings with consequent load concentration on the bearings. Under these conditions, it is advisable to use the roller aligner on top as well as bottom chocks.

Consolidating present experience, the following conclusions are drawn:

1. Roll neck bearings fail mainly because of poor load distribution. 2. Many top roll mountings are favorable because of their flexibility. 3. The Bantam roller aligner accomplishes self-alignment and good load distribution by its antifriction character.

The Iron and Steel Division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, has just issued a comprehensive factual report on the iron and steel industry, which was prepared by J. J. W. Palmer, assistant chief of the division. The study traces the industry from its inception in the United States until the present time, providing details of processes and other pertinent facts. Recent production and distribution figures are included, along with a map showing the location of the industry.

Research has revealed that the weather resistance of galvanized sheets is in direct relation to the weight of the protective coating, according to technicians of the Federal Housing Administration. Many manufacturers of galvanized sheets, they point out, now are using a standard of two ounces of zinc to the square foot of sheeting. Zinc, it is stated, is impervious to rust and, because it is inexpensive, is widely used to rust-proof iron and steel.